

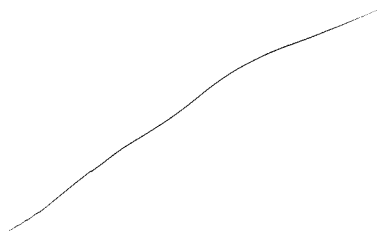


MOTOROLA

MTR2000™

**Base Station, Repeater
and Receiver**

**For Analog Conventional,
and Trunking Systems
403 - 470 MHz**



Service Manual

68P81096E35-A

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- a. the product is used in other than its normal and customary manner;
- b. the product has been subject to misuse, accident, neglect or damage;
- c. unauthorized alterations or repairs have been made, or unapproved parts used in the equipment.

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LICENSED PROGRAMS -- Motorola software provided in connection with this order is warranted to be free from reproducible defects for a period of one (1) year. All material and labor to repair any such defects will be provided free of charge for the full warranty period, and **SUBJECT TO THE DISCLAIMER IN BOLD FACE TYPE.**

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In order to obtain performance of this warranty, purchaser must contact its Motorola salesperson or Motorola at the address first above shown, attention Quality Assurance Department.

FCC INTERFERENCE WARNING

The FCC requires that manuals pertaining to Class A and Class B computing devices must contain warnings about possible interference with local residential radio and TV reception. This warning reads as follows:

NOTE: The equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial or residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with its instruction manual, may cause harmful interference to radio communication.

ELECTROMAGNETIC COMPATIBILITY (U.S.)

This product conforms with the protection requirements of Council Directive 89/336/EEC of 3rd May 1989 (EMC) on the approximation of the laws of the Member States relating to electromagnetic compatibility.

ENVIRONMENTAL INFORMATION

Material Content

The material content of the MTR2000 is 16% of the product it replaces.

The following table provides a rough estimate of the material content of the station. The actual percentages vary in relation to the station configuration. The power supply is not included in the percentage of weights since the end-of-life value is dependent on the model of supply used in the station.

Most of the Material categories are self explanatory. Copper bearing materials:

- include any material that contains copper.
- primarily consist of circuit boards.
- exclude cables (separate Material category).

Material	% by weight
Aluminum	92%
Steel	2%
Copper Bearing	4%
Cable	1%
Polycarbonate	1%

Beryllium Oxide has been used in the power amplifier. Beryllium Oxide should not be subjected to any process which will generate dust.

Features

Over 92% of the station is made of aluminum, one of the most recycled materials commonly available today. In addition, the aluminum used in the station consists of 90-95% recycled content.

Plastic use has been minimized since the market for recycled engineering plastics is limited. The plastic which has been used for the front panel is a relatively clean and pure resin.

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MTR2000TM

Base Station, Repeater and Receiver

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STATION OVERVIEW

Station Functional Block Diagram and Exploded View	68P81095E13
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RECEIVER MODULES

TRX4014A, CRX4004A

TRX4014A Receiver Module (403 to 470 MHz)

CRX4004A Receiver Module without
internal preselector(403 to 470 MHz)

68P81094E06

TRANSMITTER MODULES

TTX4014A

TTX4014A Exciter Module (403 to 470 MHz)

68P81094E07

TTX1054A, TTX1004A

TTX1054A 30 W Power Amplifier Module (403 to 470 MHz)

TTX1004A 40 W Power Amplifier Module (403 to 470 MHz)

68P81094E09

TTX1010A, TTX1020A

TTX1010A 100 W Power Amplifier Module (403 to 435 MHz)

TTX1020A 100 W Power Amplifier Module (435 to 470 MHz)

68P81094E08

STATION CONTROL MODULE

TCN6273C

TCN6273C Station Control Module

68P81094E31

WIRELINE INTERFACE BOARDS**TTN5066A**

TTN5066A 4-Wire Euro Wireline Interface Board **68P81094E27**

TTN5067A

TTN5067A 4-Wire Wireline Interface Board with DC Remote **68P81094E28**

AUXILIARY I/O BOARD**CLN6698A**

CLN6698A Auxiliary I/O Board **68P81094E74**

BACKPLANE**TTN5062B**

TTN5062B Backplane Interconnect Board **68P81094E32**



This graphic symbol appears on the station front panel (and other station surfaces) as a reminder that the station can become extremely hot during normal station operation. Turn off all power to the station and wait until it is sufficiently cool before touching the station.



INTRODUCTION

1

INTENDED USE OF THIS MANUAL

This manual is intended to be used by experienced Motorola service technicians to aid in the troubleshooting and repair of Motorola MTR2000 Field Replaceable Units (FRUs) returned from the field for repair. Information is provided to allow the technician to troubleshoot and make repairs to the component level.

2

CONTENTS OF MANUAL

Product Covered in this Manual

This manual contains detailed servicing information for the MTR2000 UHF station.

For functional information such as functional theory and system information, refer to the corresponding Instruction manual;

MTR2000 UHF Instruction Manual, 68P81096E25



The Instruction manual identifies station modules according to the Field Replacement Unit (FRU) kit numbers.

The Service manual identifies station modules according to the module kit numbers.

A cross-reference of FRU and module kit numbers is provided in Table 1. The modules are listed in alphanumeric order.

Table 1. Module vs. FRU Kit Numbers

Module Kit #	FRU Kit #	Module Description
CLN6698	CLN1216	Auxiliary I/O Board
CRX4004	CLN1214	Receiver Module (403 to 470 MHz) - without varactor preselector
TCN6273	CLN1201	Station Control Module
TRX4014	CLN1213	Receiver Module (403 to 470 MHz) - with varactor preselector
TTX1004	CLN1230	Power Amplifier (40 W, 403 to 470 MHz)
TTX1010	CLN1228	Power Amplifier (100 W, 403 to 435 MHz)
TTX1020	CLN1229	Power Amplifier (100 W, 435 to 470 MHz)
TTX1054	CLN1231	Power Amplifier (30 W, 403 to 470 MHz)
TTX4014	CLN1234	Exciter Module (403 to 470 MHz)
TTN5062	CLN1202	Station Backplane Board
TTN5066	CLN1204	4-Wire Euro Wireline Interface Module
TTN5067	CLN1203	4-Wire Wireline Interface Module with DC Remote

Station Overview

For an overall view of the station, the following information is provided:

- Station Functional Block Diagram (labelled Functional B D)
- Exploded View
- Station Top-level Parts List

Each callout number on the exploded view corresponds to a Reference Number in the Parts List.

Module Service Details

Service information for each module and board in the MTR2000 is provided in a package of drawings. Each package is identified by a unique part number, and comprises a:

- Functional Block Diagram (labelled Functional B D)
- Set Of Schematics (labelled Schematics)
- Board Layout Drawing (labelled Board Detail)
- Parts List (labelled Parts List)

The exception to the above structure is the Station Backplane Module (TTN5062A), which does not contain a Functional Block Diagram.

Most packages support more than one model of module or board.

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HOW TO USE THIS MANUAL

Finding Information

Tabs	<p>Tabs (color keyed to the frequency band color) provide quick and easy access to functional groupings of circuitry; for example, Receiver Modules, Transmitter Modules, etc.</p> <p>White tabs identify each package and are labeled with the appropriate model number(s).</p>
Table of Contents	<p>The Table of Contents provides a listing of the module/board packages according to the tab reference.</p> <p>To further aid in locating information within this manual, Table 2 provides a cross reference between the module/board model number and the corresponding tab labels. The modules are listed in alphanumeric order.</p> <p>For Example to find the package for model TTN5067, Wireline Interface Board, look up TTN5067 in Table 2. The package for this model is found behind the Wireline Boards color tab, and then behind the TTN5066, TTN5067 white tab. The indicated manual part number is at the bottom of each page of the package and the model number is indicated in the header of the package.</p>
Page Headers	<p>The relevant module or board model number (e.g., TTN5067) is shown on the header of each sheet.</p>

Table 2. Model vs. Tab Labels

Model Number	Module / Board Name	Color Tab Label	White Tab Label	Manual Part #
CLN6698	Auxiliary I/O Board	Auxiliary I/O Board	CLN6698	68P81094E74
CRX4004	Receiver module without built-in preselector	Receiver Modules	CRX4004, TRX4014	68P81094E06
TCN6273	Station Control Module	Controller Module	TCN6273	68P81094E31
TRX4014	Receiver module with built-in preselector	Receiver Modules	TRX4014, CRX4004	68P81094E07
TTX4014	Exciter Module	Transmitter Modules	TTX4014	68P81094E07
TTN5062	Backplane Board	Backplane Board	TTN5062	68P81094E32
TTN5066	Euro Wireline Interface Board	Wireline Boards	TTN5066	68P81094E27
TTN5067	4-Wire Wireline Interface Board	Wireline Boards	TTN5067	68P81094E28
TTX1004	40 W Power Amplifier Module	Transmitter Modules	TTX1054, TTX1004	68P81094E09
TTX1010	100 W Power Amplifier Module, 403-435 MHz	Transmitter Modules	TTX1010, TTX1020	68P81094E08
TTX1020	100 W Power Amplifier Module, 435-470 MHz	Transmitter Modules	TTX1010, TTX1020	68P81094E08
TTX1054	30 W Power Amplifier Module	Transmitter Modules	TTX1054, TTX1004	68P81094E09

Reading Drawings and Parts Lists

Where a package covers more than one model, a description of the differences between the models is provided at the front of the package.

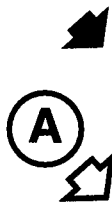
The block diagrams, schematics, and board layout drawings are provided on fold-out sheets.

Schematics

The schematics are presented for left-to-right signal flow (where practical) and contain theory notes, waveforms, dc voltages, RF levels, IC data tables, and other pertinent information to aid the technician in troubleshooting and servicing the station to the component level. Any components on the schematic which are marked **IGNORE** are not placed on the printed circuit board.

Each set of schematics begins with a block diagram followed by detailed schematics. The block diagram contains interconnected blocks. Each block represents a functional section of circuitry for which a detailed schematic follows.

Symbols are used to highlight information on the schematics as follows:



Service Notes

This symbol highlights a point at which a voltage level is provided.

The service note symbol indicates that a service note is available for the associated section of circuitry. The letter within the circle uniquely identifies the service note. The service notes are provided as a table, in close proximity to the associated schematic.

Service notes, where applicable, provide:

- a brief description of the circuitry operation.
- current level,
- voltage level,
- signal level, and
- pinout tables for custom ICs.

Board Layouts

Each drawing shows the location and reference designation for all electrical components. Where applicable, connectors, cables, and other information are shown as troubleshooting aids.

Parts Lists

A complete list of all parts is provided with the parts ordered according to the schematic reference number.

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HOW TO ORDER MODULES, PARTS, AND SERVICE AIDS

For complete information on ordering FRU replacements, models, kits, and parts, contact the appropriate facility from those listed below.

	Address	Phone No.	FAX No.
United States	Motorola Inc. Americas Parts Division 1313 E. Algonquin Rd. Schaumburg IL, 60196, USA	(800) 422-4210	(847) 538-8198
Canada			(847) 538-8193
International		(847) 538-8023	(847) 576-3023
Mexico	Motorola de Mexico Huatabampo No. 50 APDO Postal 71064 Mexico DF 06700	(525) 584-4560	(525) 584-6843
Asia	Motorola Singapore Parts Centre 1302 Lor 1 Toa Payoh Siong Hoe Ind Bldg. #01-03/04 Singapore 1231	(65) 353-0311	(65) 353-9152
Australia & New Zealand	Motorola Australia Ltd. 666 Wellington Rd. Victoria 3170 Melbourne Australia	(61) 3 566-7766	(61) 3 566-7910
Japan	Nippon Motorola Ltd. 3-20-1 Ninomi Azabu Minato-Ku Tokyo 106 Japan	(81) 3 3440 3311	(81) 3 3440 3505
Europe, Mideast & Africa	Motorola GmbH Heinrich - Hertz Strasse 1 D-65232 Taunusstein 4 Germany	(49) 6128 70 2137	(49) 6128 7 3538

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WHAT SERVICE AIDS ARE RECOMMENDED

MTR2000-Specific Service Aids

Service aids which specifically support the servicing of the MTR2000 station are listed in Table 3.

Table 3. Service Aids

	Aid	Part Number	Description
	MTR2000 Radio Service Software	RVN4148	Used to service and program the station.
	Option Card tool	6683334X01	Used to pull the option boards (such as the Wireline Interface Boards or the Auxiliary Input/Output board) from the backplane.
	Fuse, 5A Fast Acting	6583049X16	Used to replace fuse on Backplane.
	Cables		
Service Speaker to station	Service Speaker adapter cable	0185180U01	Used to connect the service speaker to the station RJ 45 Service Speaker connector on the Station Control Module.
Backplane to Power Amplifier	10-Conductor 0.3m (12in) cable	3082057V04	Used to connect the Backplane to the Power Amplifier when station is disassembled.
Backplane to Power Supply	8-Wire 0.3m (12in) cable	3082728X07	Used to connect the Backplane to the Power Supply when station is disassembled.
Power Supply to Power Amplifier	2x3 Wire 0.38m (15in) cable	3082728X06	Used to connect the Power Supply to the Power Amplifier when station is disassembled. This cable is part of the station, but can also be used as a service aid.

Table 3. Service Aids

	Aid	Part Number	Description
Backplane to Control Cluster, or Option Card, or External System	1 m (39.4in) system/ extender cable	3083384X01	Used (when station is disassembled) to connect the Backplane to the Control Cluster, or connect the Backplane to an Option Card, or connect the Backplane to an external system.
Computer to RSS Port	DB9 to RJ45 cable	3082056X02	Used to connect a computer to the RJ45 RSS port connector on the Station Control Module.
Test Equipment to Station	RJ45 to BNC cable	3083191X02	Used to test the Receiver module.
DC Supply to Station	DC cable	3082009X02	Used to connect DC power supply to station or DC battery backup to station. This cable is part of the station, but can also be used as a service aid.

Generic Service Aids

Generic service aids which are recommended for servicing the MTR2000 are as follows:

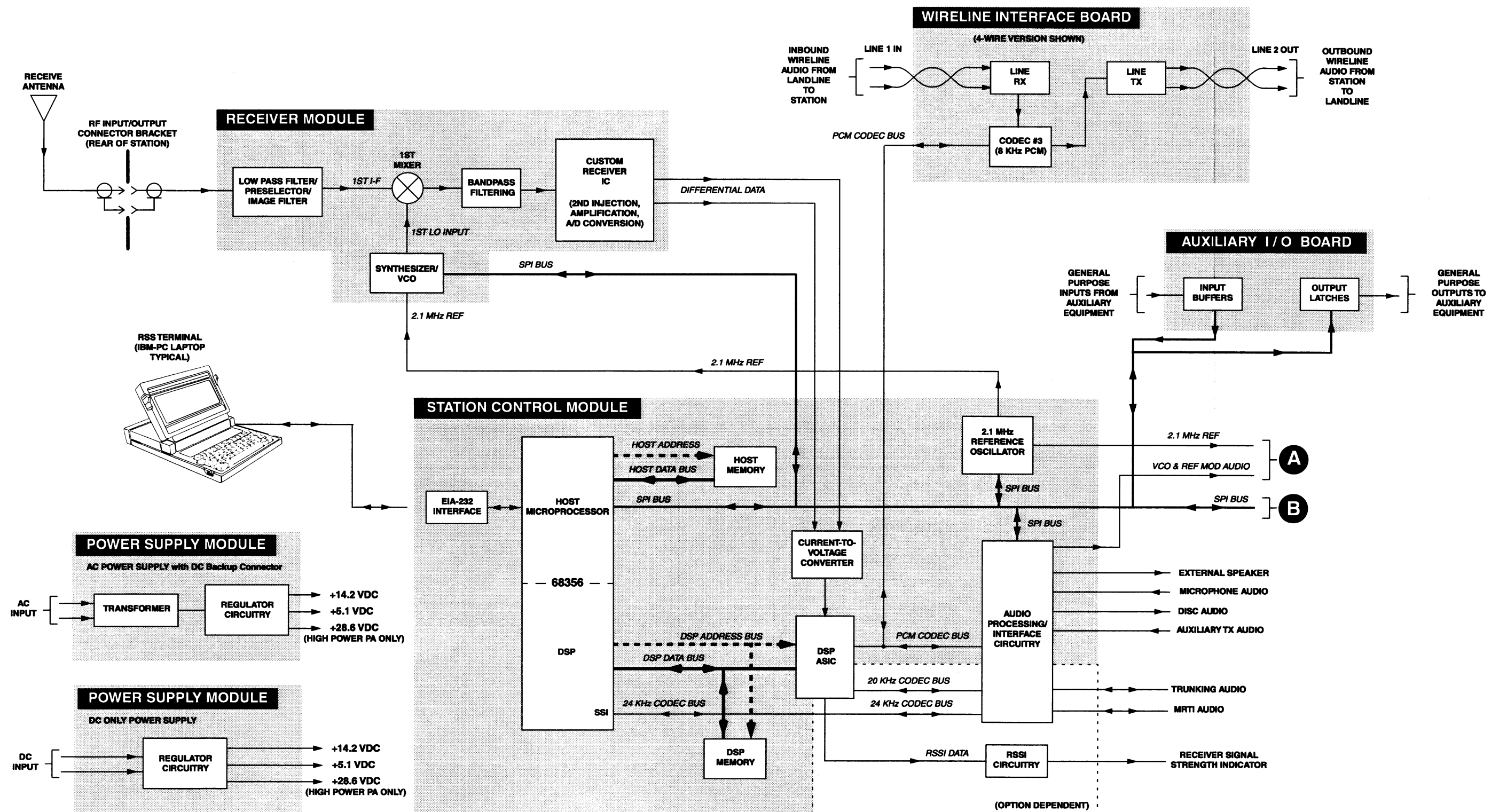
- Communications Analyzer (e.g., Motorola R2001)
- PC running Microsoft Windows™ 3.1 or Windows™ 95
- In-Line Wattmeter (Motorola S-1350 or equivalent)
- Dummy Load (50 Ω , station wattage or higher)
- Service microphone with PTT switch and 3 special function switches (GMN6147B or equivalent)
- Service speaker (HSN1000)
- female N-type to female N-type coaxial cable

For tuning preselectors, the following equipment is required:

- RF signal generator – Motorola R2600 or R2001 Communications Analyzer (see note below), or HP8656A signal generator (or equivalent)
- Dip/Peak Monitor – HP435B Power Meter (or equivalent) with HP8484A sensitive power head, Boonton Model 92E with BNC input, or R2001/R2600 using the spectrum analyzer function
- Torque driver capable of delivering 1.36Nm (12 in-lb) of torque and 10 mm deep well socket
- Tuning probe – Motorola Part No. 0180763D22, p/o TRN7799

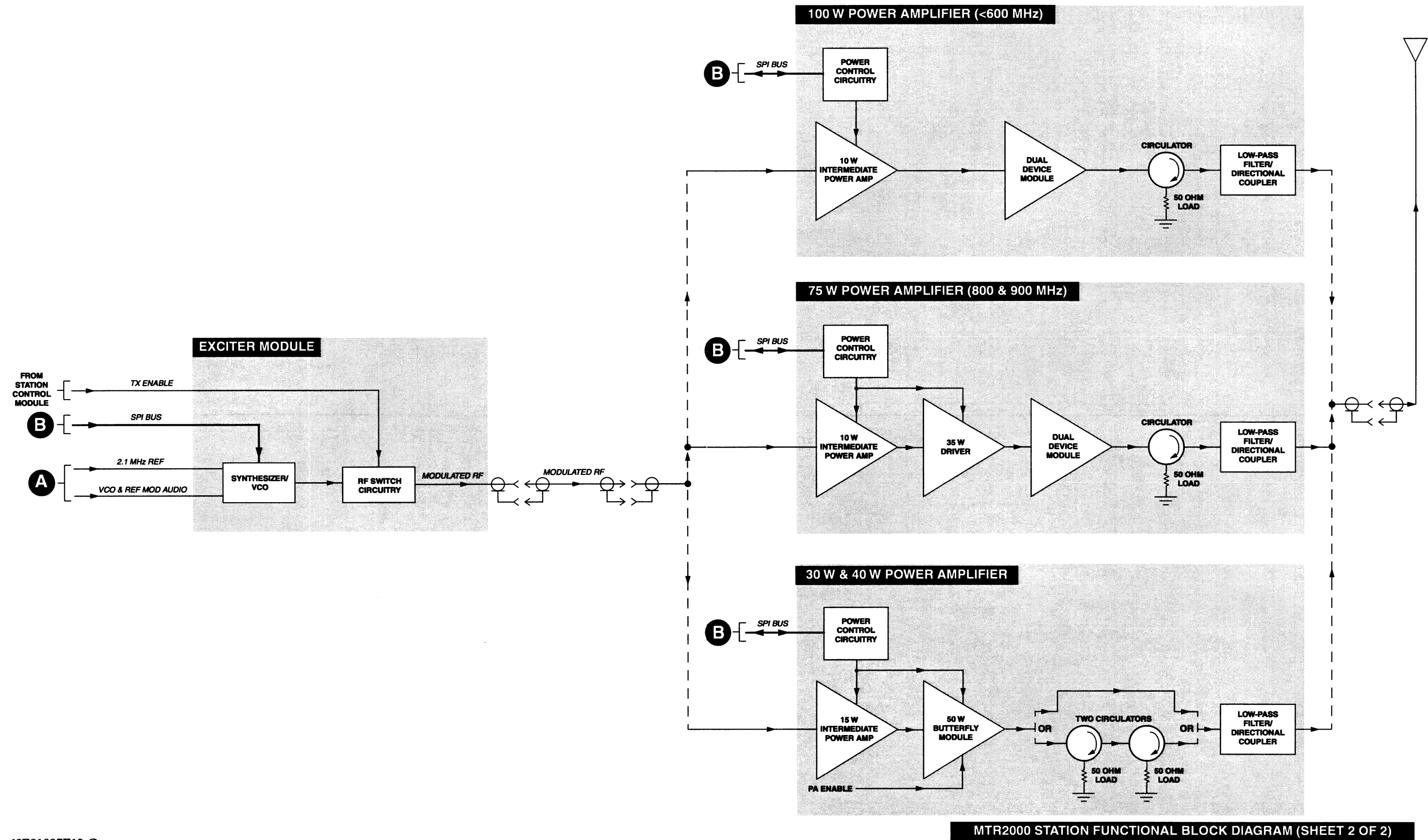
STATION OVERVIEW

UHF (403 TO 470MHz)



MTR2000 STATION FUNCTIONAL BLOCK DIAGRAM (SHEET 1 OF 2)

STATION OVERVIEW
UHF (403 TO 470MHZ)



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Parts List

UHF STATION OVERVIEW

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
TGN6153A FRONT PANEL		
1	6482633X01	PANEL FRONT
TKN9137A CABLES, STATION		
	3012029N08	BNC MALE BNC MALE 9
	3082057V03	CABLE RIBBON
TTN5215A STATON CHASSIS HARDWARE		
	0310907A61	SCR MCH M8X1/25X20 STARPAN STL
	0310907C99	RMCH M4X0.7X18 STRPAN STL (2 used)
	0310943J21	SCREW, tapping: TT4 X 0.7 x 10 (6 used)
	0310943R23	SCRTPG TT4X0.7X13 STRFLTCHS (12 used)
	0383498N14	SCREW, tapping: M4 x 0.7 x 18 (8 used)
	0782635X01	BRACKET OPTION CARD
2	1582625X02	HOUSING, TOP/BOT CASTING (2 used)
3	3082728X04	CABLE, 8-WIRE 4"
	4210217A04	STRAP, tie: 0.184 x 7.31" lg (5 used)
	5485282U01	Label, Barcode
TTN5239A BACKPLANE, HARDWARE HI TIE		
	0310943J21	SCREW, tapping: TT4 X 0.7 x 10 (4 used)
	0312016A03	SCRTPG TT3X0.5X8 STARPAN (2 used)
5	2682636X07	SHIELD, BACKPLANE HI TIER 22
	5485212U02	LABEL, THERMAL XFR RIBBON
	5485212U04	LABEL
THN6762A MODULE HOUSING CONTROLLER		
	0383498N14	SCREW, tapping: M4 x 0.7 x 18 (6 used)
7	1582628X02	HOUSING CNTL BOTTOM CASTING
8	1582629X02	HOUSING CNTL TOP CASTING
9	3282170V01	GASKET RF (44 used)
	5485282U01	Label, Barcode
THN6763A MODULE HOUSING RECEIVER		
	0383498N14	SCREW, tapping: M4 x 0.7 x 18 (5 used)
11	1582630X02	HOUSING RX BOTTOM CASTING
12	1582679X02	HOUSING RX TPO CASTING
9	3282170V01	GASKET RF (32 used)
13	3282835X01	GASKET RF DIECUT
	3283322X01	GASKET,BNC
	5485282U01	Label, Barcode
THN6764A MODULE HOUSING EXCITER		
	0383498N14	SCREW, tapping: M4 x 0.7 x 18 (5 used)
15	1582631X02	HOUSING EXCITER BOTTOM CASTING
16	1582632X02	HOUSING EXCITER TOP CASTING
9	3282170V01	GASKET RF (33 used)
13	3282835X01	GASKET RF DIECUT
	3283322X01	GASKET,BNC
	5485282U01	Label, Barcode
THN6785A MODULE HOUSING PA LOW POWER		
	0310907A40	SCRMCH(M4X0.7X25) STRPANSTLCAD (8 used)
	0312016A03	SCRTPG TT3X0.5X8 STARPAN (24 used)
	0383498N14	SCREW, tapping: M4 x 0.7 x 18 (2 used)
	0783544X01	BRACKET, OMNI
	0900816159	CONNECTOR, receptacle: coaxial
18	1582626X02	COVER PA & PS CASTING
19	2682624X04	HEATSINK LOW POWER AMP
	3082728X05	CBL 6-WIRE
	3282170V01	GASKET RF (56 used)
	4282981X01	STRAP PA BRAIDED
	5482006W01	Label, PCB barcode
	5483323X01	LABEL, FREQ. REF.

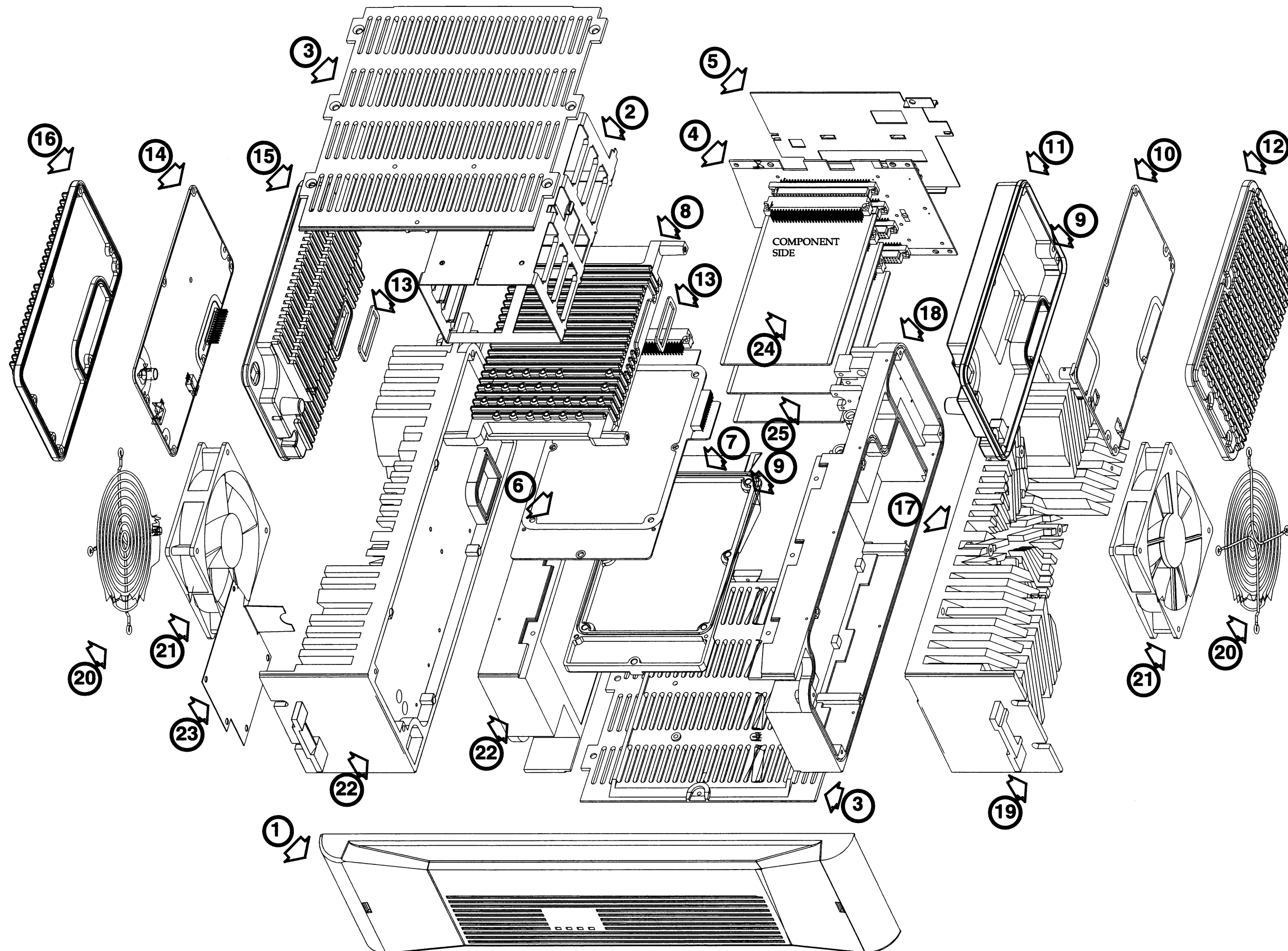
UHF STATION OVERVIEW

REFERENCE NUMBER	MOTOROLA PART NO.	DESCRIPTION
THN6786A MODULE HOUSING PA HIGH POWER		
	0310907A40	SCRMCH(M4X0.7X25) STRPANSTLCAD (8 used)
	0310907C66	SCRMCH M4X0.7X45MM STLCAD (4 used)
	0310917A51	SCRMCH M3.5X0.6X12 STPN STLZNC (3 used)
	0312016A03	SCRTPG TT3X0.5X8 STARPAN (26 used)
	0783544X01	BRACKET, OMNI
	0900816159	CONNECTOR, receptacle: coaxial
	1383852R01	GRILLE, fan
20	1582626X02	COVER PA & PS CASTING
18	2182805H05	1000 pF, +/-0%; 200V (2 used)
19	2682624X03	HEATSINK HIGH POWER AMP
	3082728X05	CBL 6-WIRE
9	3282170V01	GASKET RF (56 used)
	5482006W01	Label, PCB barcode
	5483323X01	LABEL, FREQ. REF.
21	5983663R09	FAN DC 1" THK X120MMX120MM
CLN1220A FRU 500W AC POWER SUPPLY (MTR2000)		
22	TPN6196A	POWER SUPPLY AC 500W MAIN BD
	0182516W01	PWR SUP AC/DC 500W 50/60M23OUT
	0310943J21	SCREW, tapping: TT4 X 0.7 x 10 (2 used)
23	1583305X01	COVER, POWER LOCK CONN
CLN1221A FRU 250W AC POWER SUPPLY (MTR2000)		
23	TPN6197A	POWER SUPPLY AC 250W MAIN BD
	0182516W02	PWR SUP AC/DC 250W 50/60HZ
	0310943J21	SCREW, tapping: TT4 X 0.7 x 10 (2 used)
24	1583305X01	COVER, POWER LOCK CONN
CLN1222A FRU 500 WATT DC ONLY PS (MTR2000)		
23	CPN6059A	POWER SUPPLY DC 500W
	CPN6060A	CBL, DC POWER INPUT
	0182516W04	PWR SUP DC ONLY 28V 500W
	0310943J21	SCREW, tapping: TT4 X 0.7 x 10 (2 used)
	3082009X02	CBL, DC POWER-INW/30A FUSE
CLN1223A FRU 250 WATT DC ONLY PS (MTR2000)		
23	CPN6058A	POWER SUPPLY,DC,250W
	CPN6060A	CBL, DC POWER INPUT
	0182516W03	PWR SUP DC ONLY 14V 250W
	0310943J21	SCREW, tapping: TT4 X 0.7 x 10 (2 used)
	3082009X02	CBL, DC POWER-INW/30A FUSE
STATION BOARDS		
4	TTN5062B	BACKPLANE BOARD
6	TCN6273C	CONTROLLER BOARD
10	CRX4004A	RECEIVER BOARD (403 to 470 MHz) WITHOUT INTERNAL PRE SELECTOR
10	TRX4014A	RECEIVER BOARD (403 to 470 MHz)
14	TTX4014A	EXCITER BOARD (403 to 470 MHz)
17	TTX1054A	30 W P A BOARD (403 to 470 MHz)
17	TTX1004A	40 W P A BOARD (403 to 470 MHz)
17	TTX1010A	100 W P A BOARD (403 to 435 MHz)
17	TTX1020A	100 W P A BOARD (435 to 470 MHz)
24	TTN5066A	4 WIRE EURO WIRELINE BOARD
24	TTN5067A	4 WIRE WIRELINE BOARD WITH DC REMOTE
25	CLN6698A	AUXILIARY I/O BOARD

Note: Power supply kits are available only as FRU kits and will be serviced by the vendor i.e. ABB.

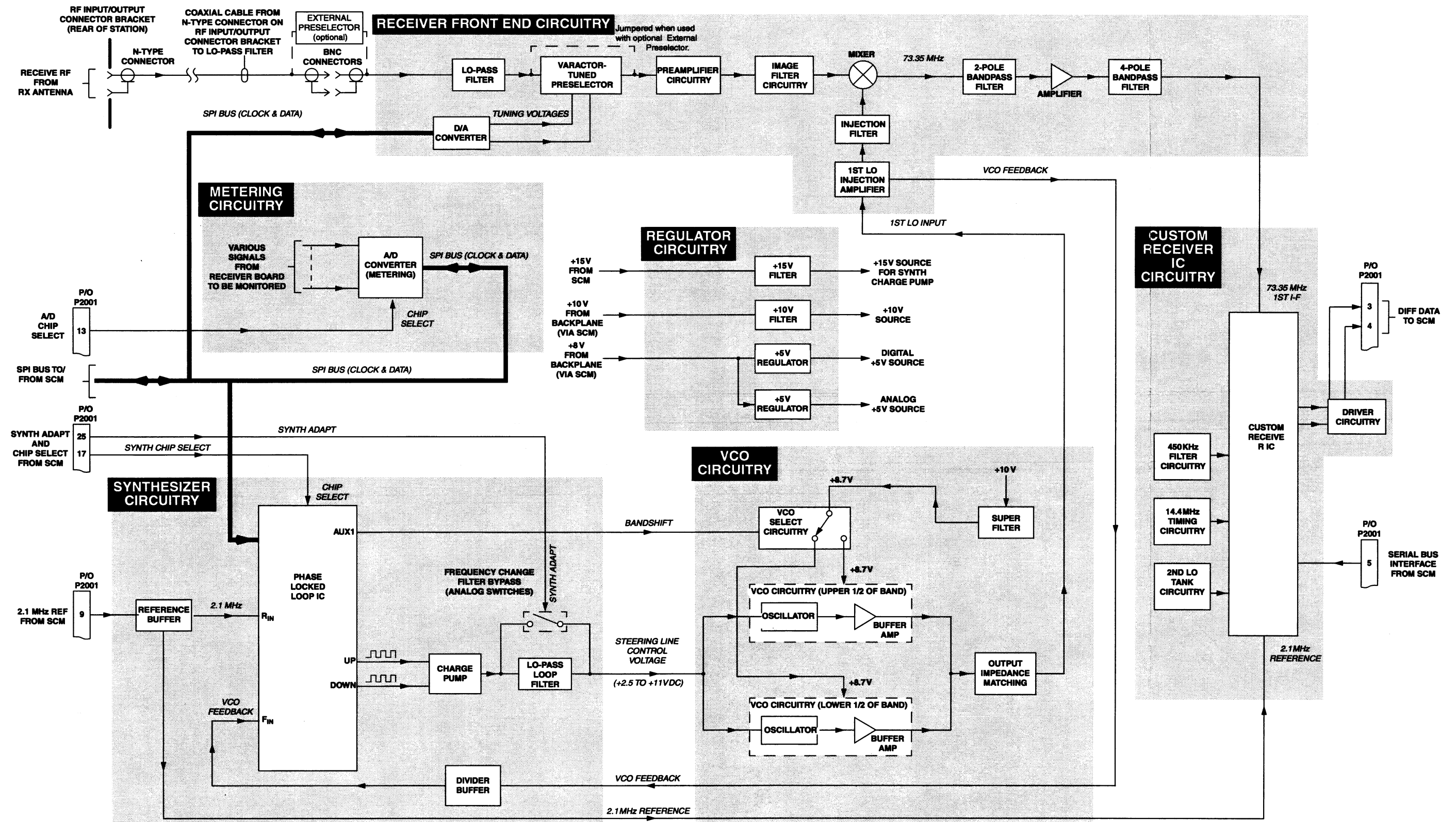
STATION OVERVIEW

UHF (403 TO 470MHZ)



RECEIVER MODULE

MODEL TRX4014A/CRX4004A

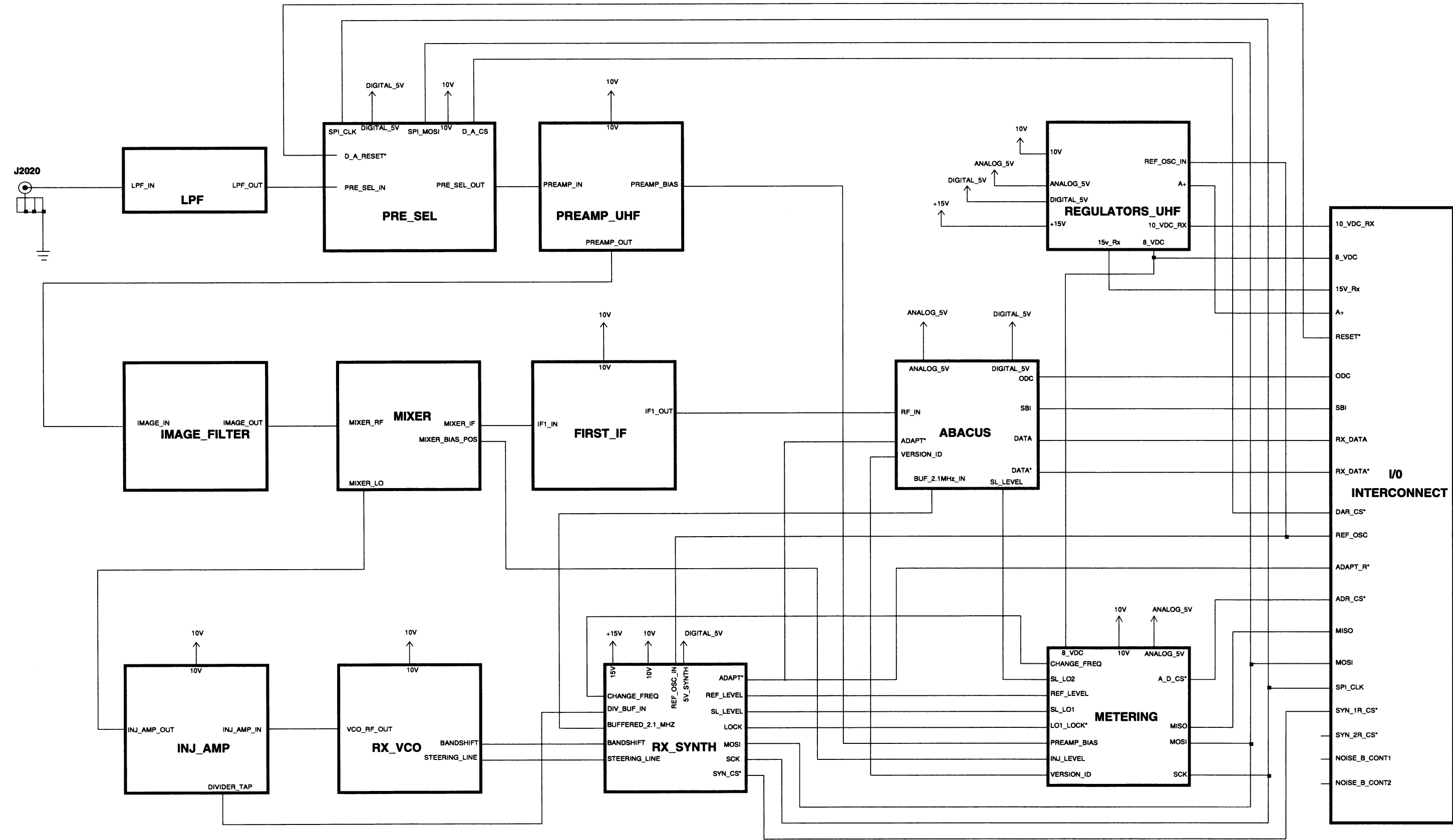


UHF RECEIVER FUNCTIONAL BLOCK DIAGRAM

RECEIVER MODULE
MODEL TRX4014A/CRX4004A

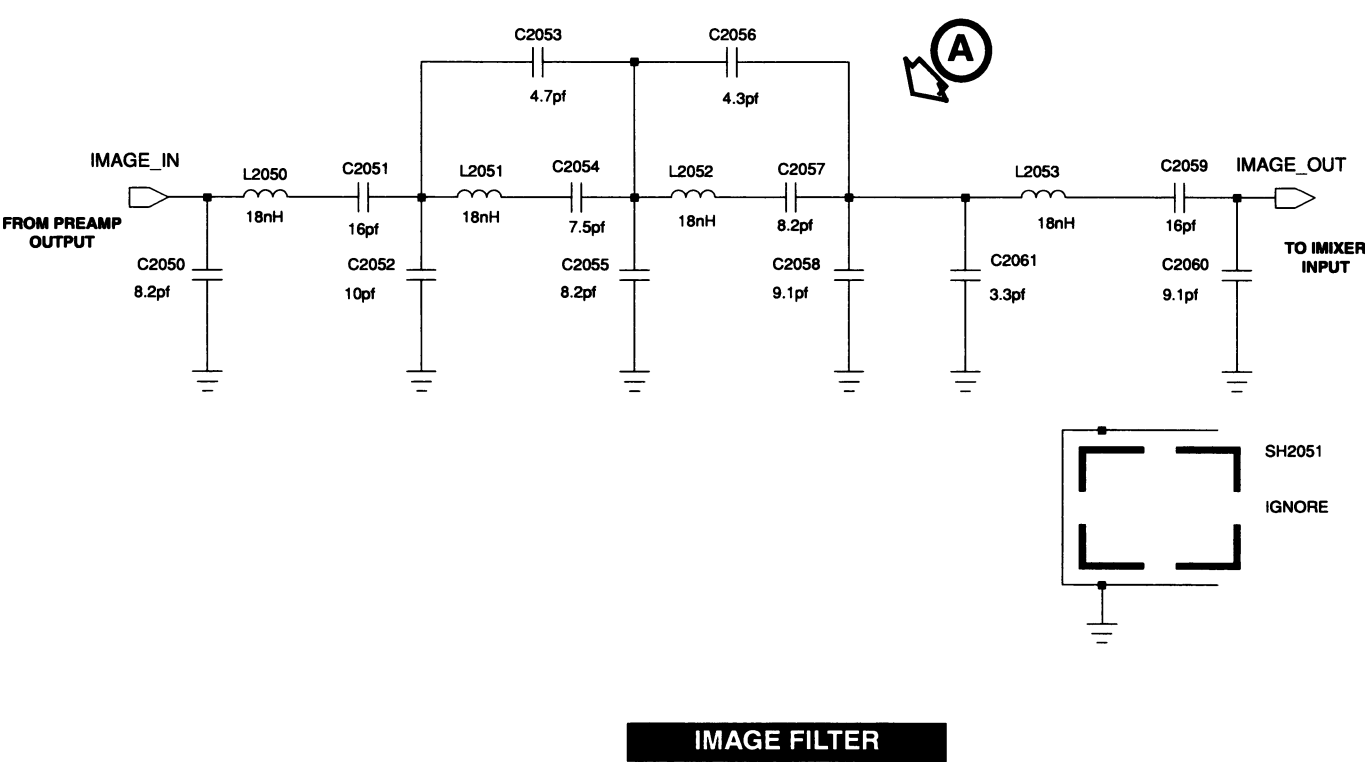
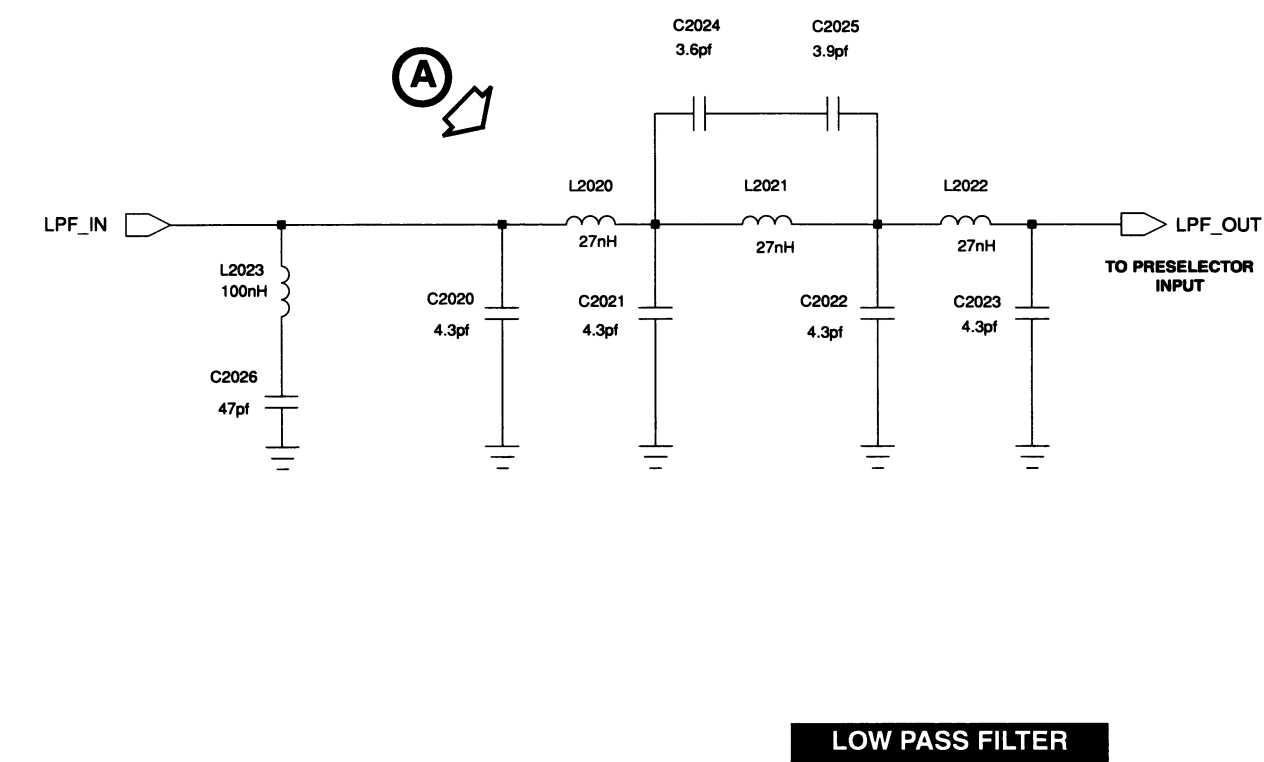
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RECEIVER MODULE
MODEL TRX4014A/CRX4004A



UHF RECEIVER MODULE BLOCK DIAGRAM

RECEIVER MODULE
MODEL TRX4014A/CRX4004A



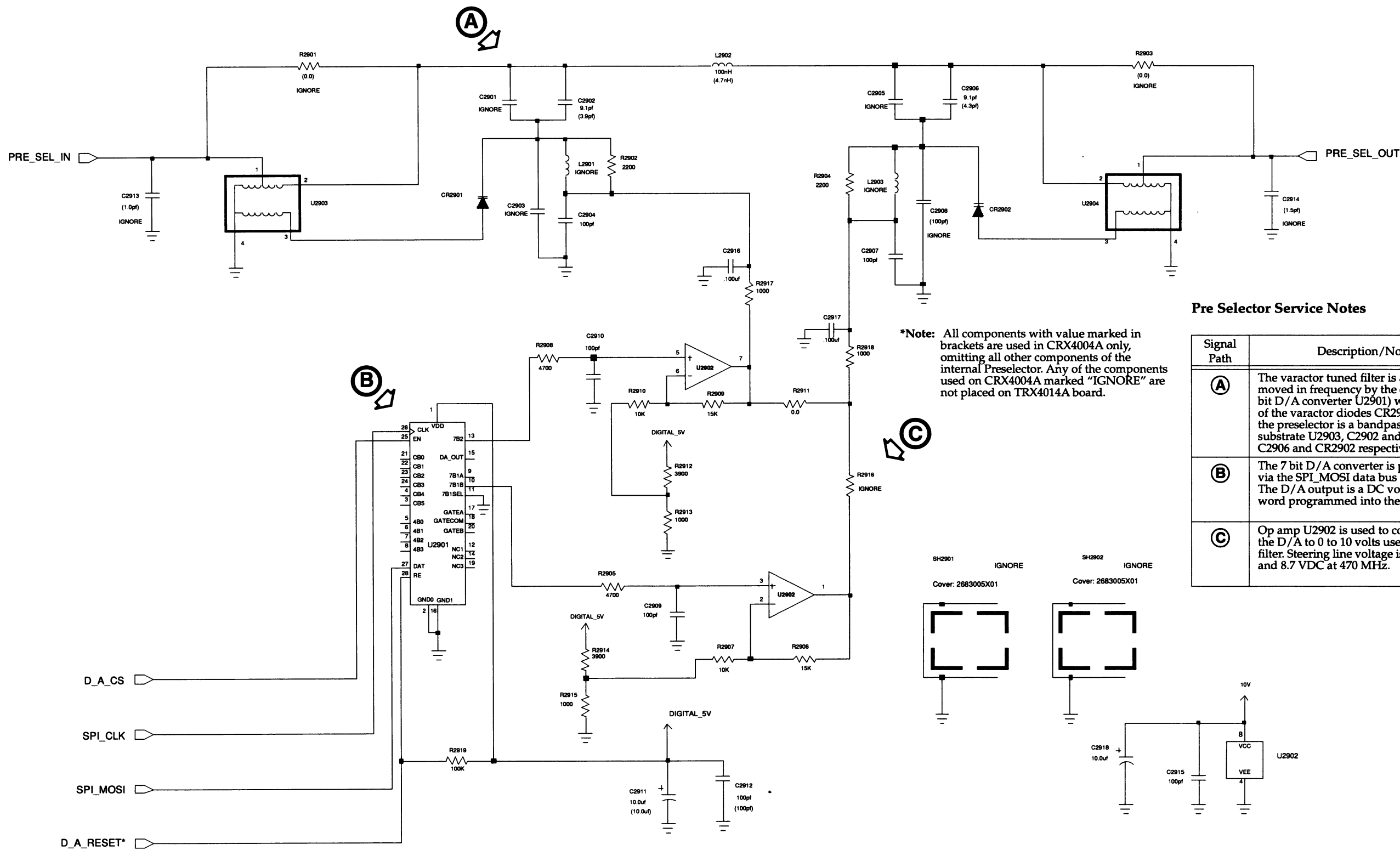
Low Pass Filter Service Notes

Signal Path	Description/Nominal Signal Levels
A	The low pass filter corner frequency is 500 MHz. Typical insertion loss is 1.0 dB. L2023 and C2026 notches frequencies around 73.35 MHz. The input and output are approximately 50 ohms.

Image Filter Service Notes

Signal Path	Description/Nominal Signal Levels
A	The image filter is an 10 pole bandpass filter designed to attenuate the image frequency. Typical insertion loss is 1.2 dB. Attenuation at the 549.7 MHz image frequency is 50 dB typical. The input and output impedance are 50 ohms.

RECEIVER MODULE
MODEL TRX4014A/CRX4004A



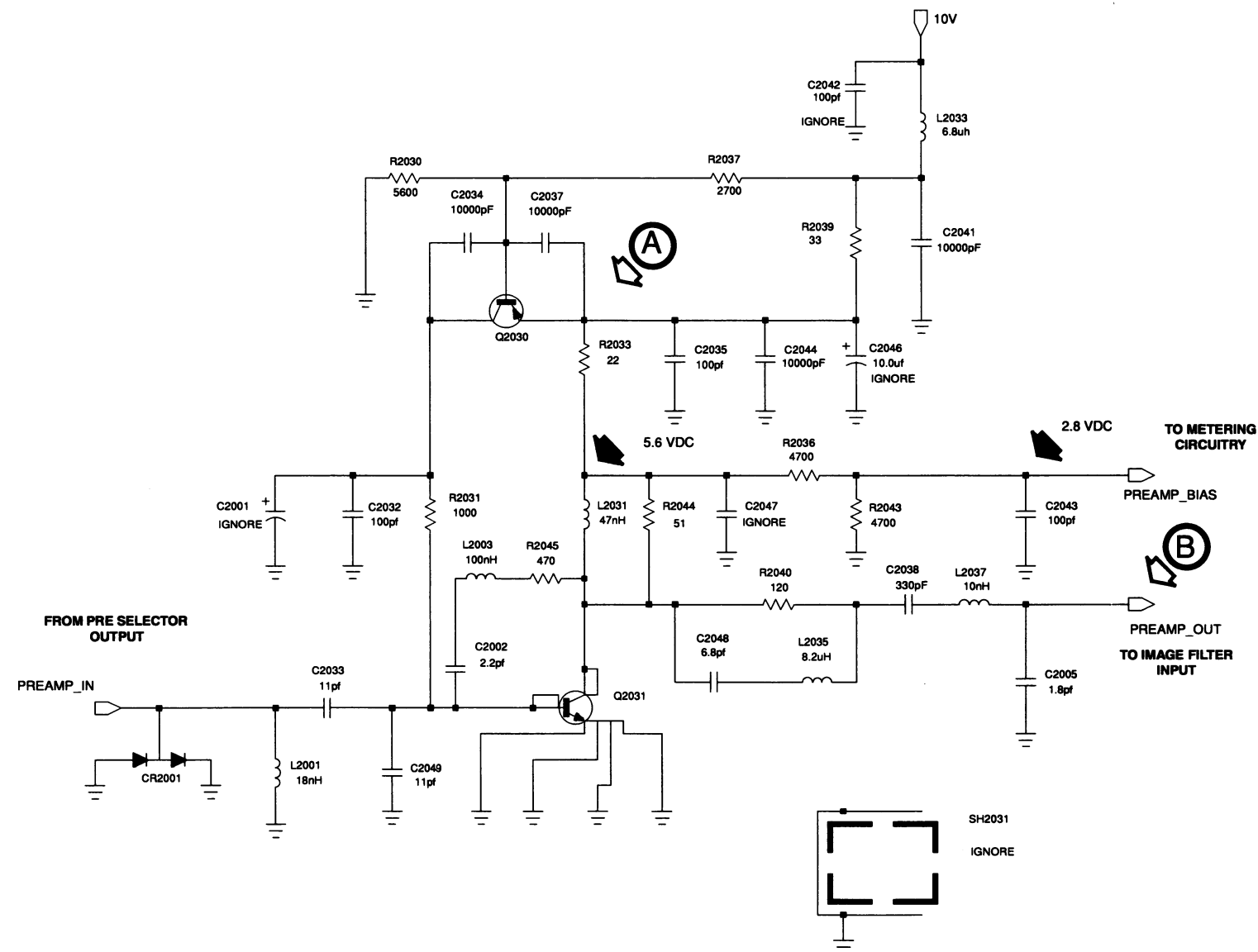
Pre Selector Service Notes

Signal Path	Description/Nominal Signal Levels
(A)	The varactor tuned filter is a two pole filter steered or moved in frequency by the control voltage (generated by 7 bit D/A converter U2901) which changes the capacitance of the varactor diodes CR2901 and CR2902. Each half of the preselector is a bandpass filter primarily comprised of substrate U2903, C2902 and CR2901 and substrate U2904, C2906 and CR2902 respectively.
(B)	The 7 bit D/A converter is programmed by the controller via the SPI_MOSI data bus and the SPI_CLK clock line. The D/A output is a DC voltage proportional to the data word programmed into the D/A.
(C)	Op amp U2902 is used to convert the 0 to 5 volt output of the D/A to 0 to 10 volts used by steering line to control filter. Steering line voltage is typically 2.7 VDC at 403 MHz and 8.7 VDC at 470 MHz.

PRE SELECTOR

RECEIVER MODULE

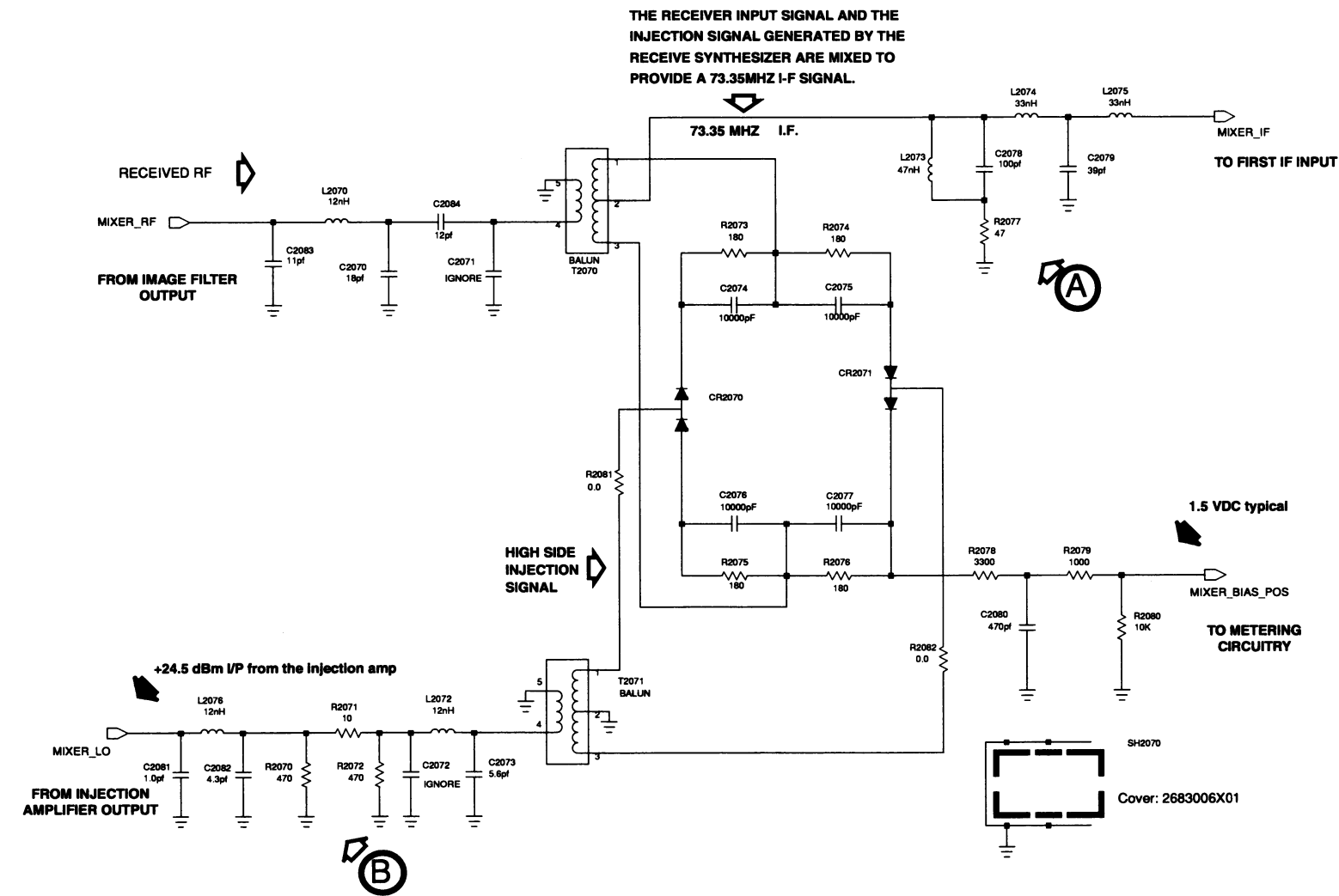
MODEL TRX4014A/CRX4004A



Pre Amplifier Service Notes

Signal Path	Description/Nominal Signal Levels
Ⓐ	Q2030 provides a constant current source for RF amplifier device Q2031. R2030 and R2037 set Q2030 base voltage which in turn determines voltage drop across R2039 and thus current through R2039, R2033 and collector of Q2031. Typical current through R2033 is 77 mA DC.
Ⓑ	Preamplifier provides approximately 14 dB of gain. The input and the output are approximately 50 ohms. Third order input intercept point of the preamp is approximately 16 dBm.

RECEIVER MODULE
MODEL TRX4014A/CRX4004A

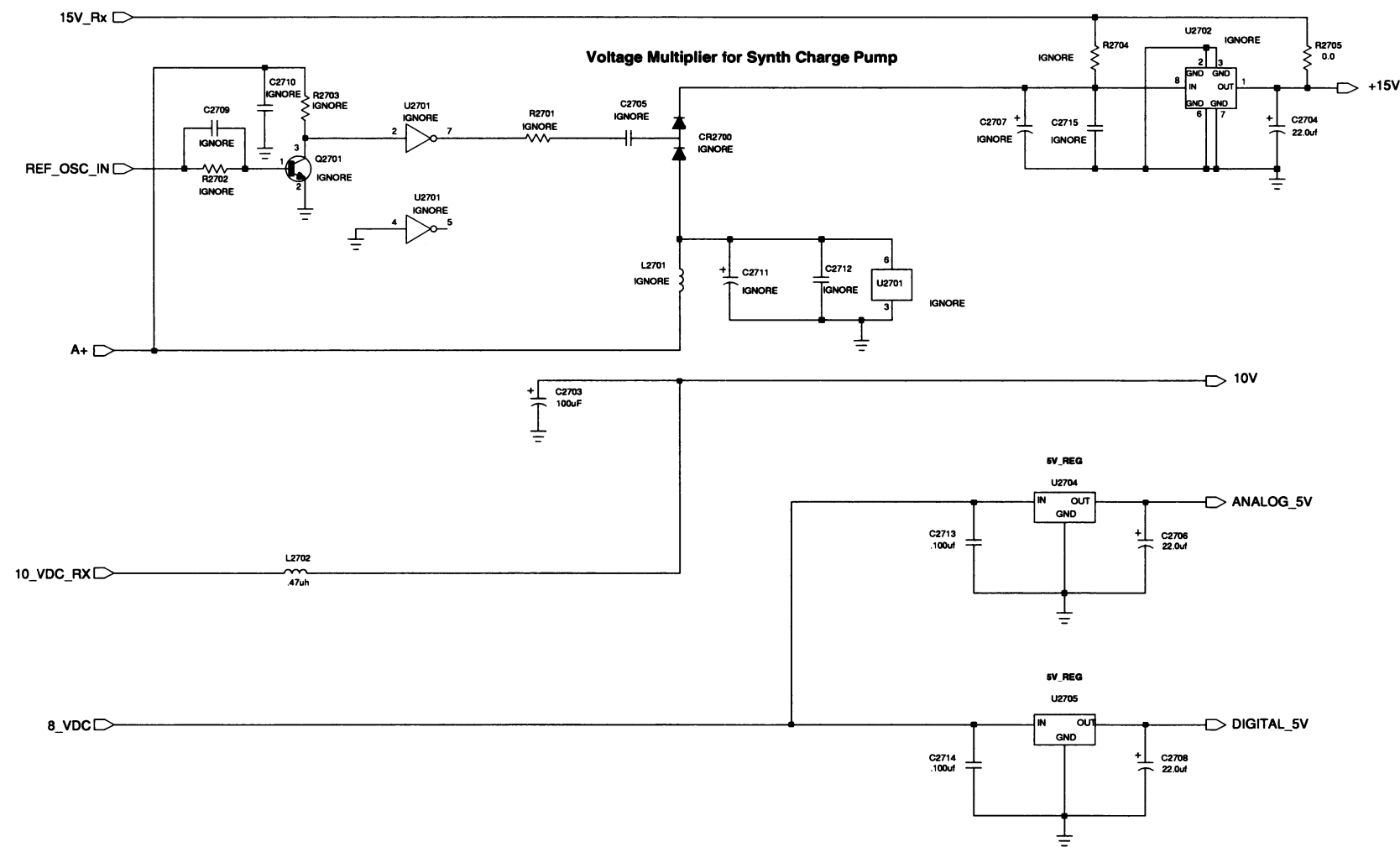


Mixer Service Notes

Signal Path	Description/Nominal Signal Levels
(A)	Diplexer network which matches all frequencies except the IF frequency (73.35 MHz) to 50 ohms.
(B)	2 dB pad used to attenuate the LO signal from the injection amp.

MIXER

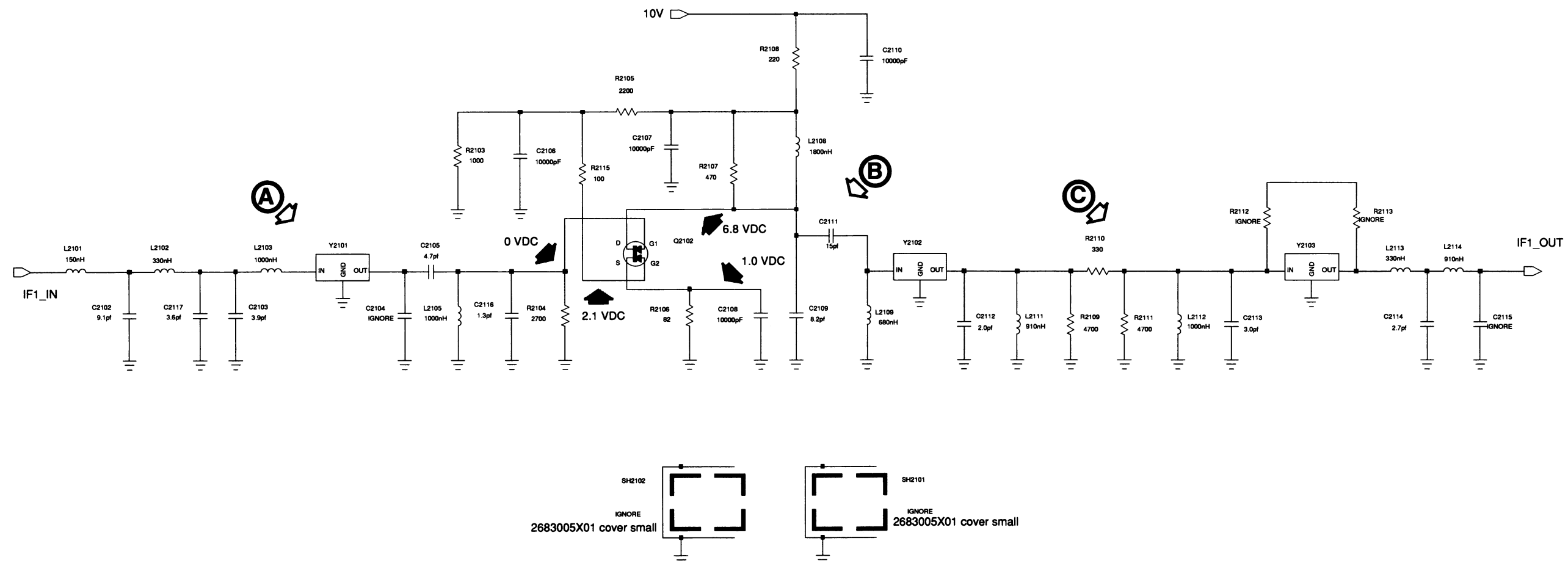
RECEIVER MODULE
MODEL TRX4014A/CRX4004A



REGULATORS

RECEIVER MODULE

MODEL TRX4014A/CRX4004A



First I-F Service Notes

Signal Path	Description/Nominal Signal Levels
Ⓐ	First 2 pole filter has a 3 dB bandwidth of 11 kHz and provides 40 dB of attenuation at +/- 900 kHz from IF frequency.
Ⓑ	IF amplifier provides nominal in circuit gain of 22 dB when terminated by the crystal filters.
Ⓒ	Four pole filter has a 3 dB bandwidth of 11 kHz and provides 70 dB of attenuation at +/- 900 kHz from IF frequency. Overall IF has 10.5 kHz bandwidth centred at 73.35 MHz.

FIRST IF

RECEIVER MODULE

MODEL TRX4014A/CRX4004A

U2500 (ABACUS) PINOUT TABLE

Pin #	Pin Name	Signal Type	Pin Description
1	ODC	Output	Output data clock
2	VDDH	Power	Digital supply
3	DGND	Power	Digital ground
4	VDD	Output	Int. reg. digital 3V
5	VSSR	Power	Substrate ring
6	OVCC	Power	Oscillator supply
7	OGND	Power	Oscillator ground
8	OB	Output	Oscillator bias
9	OTBY	Input	Oscillator tank bypass
10	OT	Input	Oscillator tank
11	SSL	Output	Oscillator steering line
12	SUB	Power	Substrate
13	REFI	Input	Reference input
14	VCC	Power	Analog supply
15	GND	Power	Analog ground
16	DAF2	Output	DAC filter cap 2
17	NLS	Input	Nominal DAC level set
18	DAF	Output	AC filter cap
19	DAFG	Output	DAC filter cap
20	IFI	Power	IF isolation
21	BYP2	Output	Mobile IF preamp bypass
22	BYP1	Output	Mobile IF preamp bypass
23	VCCP2	Power	Mobile IF amp supply
24	IFIN2	Input	Mobile IF input
25	GNDI	Power	IF input ground
26	IFIN	Input	Portable IF input
27	VCCP	Power	Portable IF amp supply
28	LOx	Input	LO input bypass
29	LO	Input	LO input
30	GNDO	Power	IF output ground
31	MOx	Output	Mixer output
32	MO	Output	Mixer output
33	T1C2	Power	1st tank supply
34	T1C	Power	1st tank supply
35	T1x	Output	1st tank input
36	T1	Output	1st tank input
37	T2C	Power	2nd tank supply
38	T2x	Output	2nd tank input
39	T2	Output	2nd tank input
40	CAPx	Output	DC feedback cap
41	CAP	Output	DC feedback cap
42	VPP	Power	Supply for charge pump
43	COL	Input	Internal osc device
44	EMIT	Output	Internal osc device

U2500 (ABACUS) PINOUT TABLE (continued)

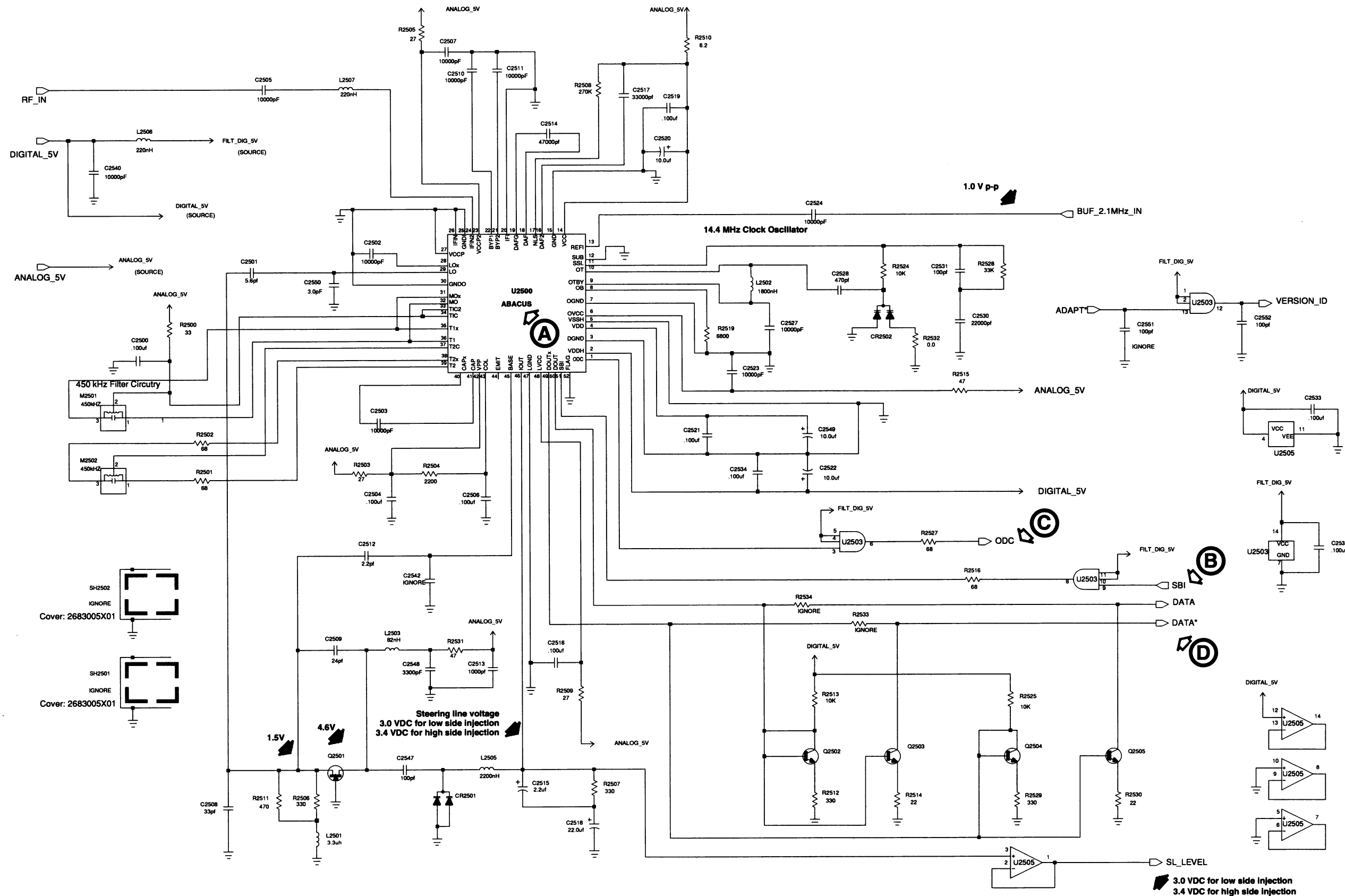
Pin #	Pin Name	Signal Type	Pin Description
45	BASE	Input	Internal osc device
46	IOUT	Output	2nd LO steering line
47	LGND	Power	2nd LO ground
48	LVCC	Power	2nd LO supply
49	DOUTx	Output	Differential output data
50	DOUT	Output	Differential output data
51	SBI	Input	Serial bus input
52	FLAG	Power	Cavity ground

Abacus Service Notes

Signal Path	Description/Nominal Signal Levels
Ⓐ	Custom receiver IC provides down conversion of the first IF to a second IF, amplification and filtering of second IF signal and digital conversion of second IF signal resulting in differential data being output at U2500 pins 49 and 50.
Ⓑ	Serial Bus Interface (SBI) is used by the control board to program abacus functions to set second LO frequency and alter internal gain.
Ⓒ	Output Data Clock (ODC) is used to clock the output data. For 20 and 33.33 ksamples/sec the ODC rate is 2.4 MHz and for 60 ksamples/sec the ODC rate is 4.8 MHz (2.4 MHz and 20ksamples/sec are used).The ODC is also used to clock the SBI word.
Ⓓ	Differential output data from abacus contains the demodulated voice or data information from the receive frequency carrier.

RECEIVER MODULE

MODEL TRX4014A/CRX4004A



ABACUS

RECEIVER MODULE
MODEL TRX4014A/CRX4004A

Synthesizer Service Notes

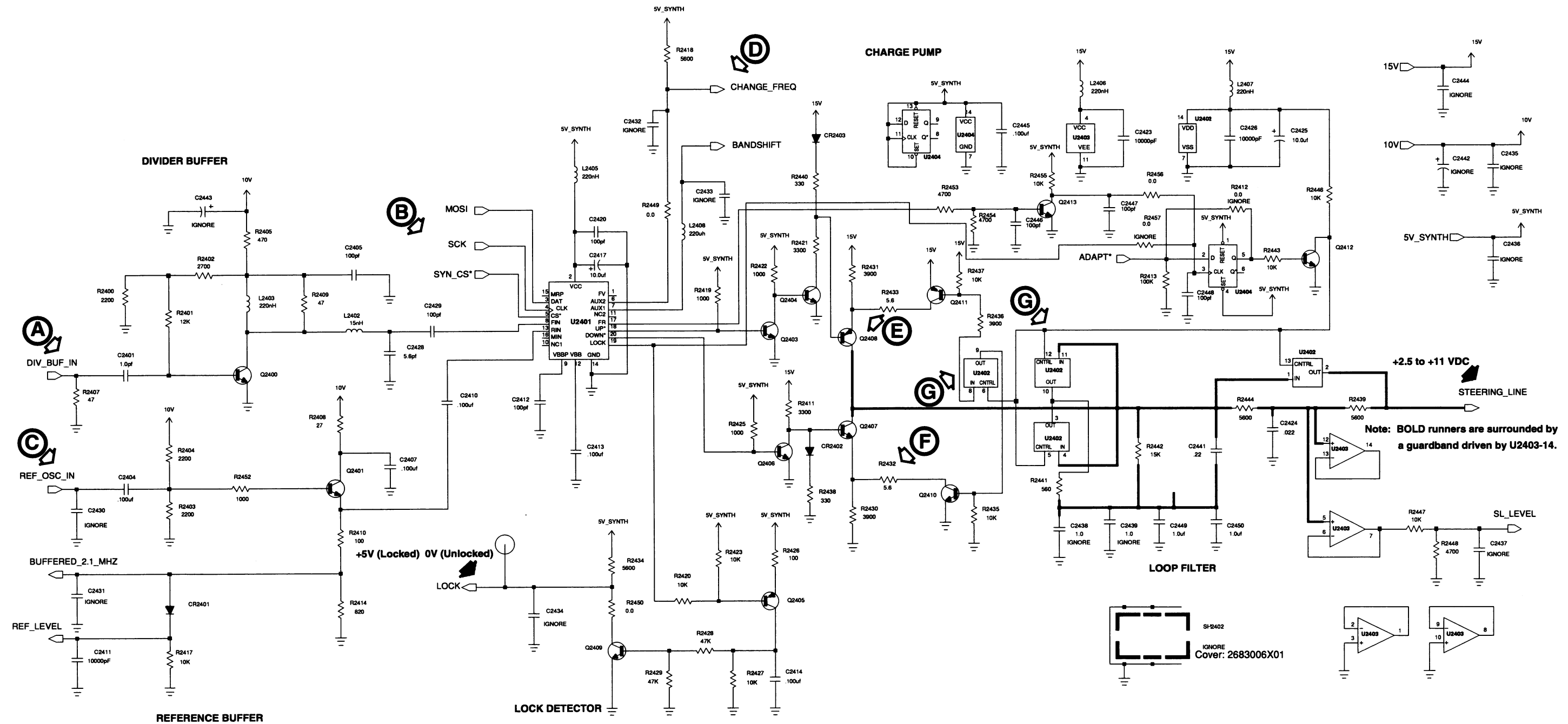
Signal Path	Description/Nominal Signal Levels
Ⓐ	A sample of the VCO output signal is fed to the VCO Divider Buffer Q2400 and output to the feedback input at U2401–pin 8.
Ⓑ	The MOSI serial data signal contains frequency selection data from the Host processor on the SCM. This data is clocked by the SCK signal.
Ⓒ	2.1 MHz input from the SCM is buffered by Q2401 and fed to the Reference Input (RIN) of PLL synthesizer U2401–pin 13.
Ⓓ	PLL synthesizer U2401 compares the frequency of RIN (2.1 MHz from the SCM) and FIN (VCO feedback signal divided internally per programming data from station control via MOSI data line) and generates variable-width UP and DOWN pulses (pins 18 & 20). With the synthesizer locked, pins 18 & 20 generate extremely small pulse widths. With VCO <i>below</i> desired frequency, pin 18 pulse widths increase; with VCO <i>above</i> desired frequency, pin 20 pulse widths increase.
Ⓔ	+13.7 V with narrow 0.8 V DOWN pulses at 6.25 KHz rate when locked.
Ⓕ	+1.3 V with narrow 0.8 V UP pulses at 6.25 KHz rate when locked.
Ⓖ	The charge pump and loop filter convert UP/DOWN pulses from the PLL IC to a dc steering voltage which is fed to dual VCO circuitry to control the VCO output frequency. Adapt* is pulsed low for the first 10 msec (small frequency jump) or 20 msec (large frequency jump) when the frequency is changed. While adapt* is low, analog switches U2402 are closed to bypass the loop filter for fast frequency change.

U2401 Pinout Table

Pin #	Signal Name	Description/Nominal Voltage
1	FV	Test point; divided down VCO frequency; 6.25 KHz or 5KHz sawtooth waveform in locked condition
2	VCC	IC power; +5 V
3	DATA	Serial data input; 0–5 V logic level
4	CLK	Clock for serial data programming; 0–5 V logic level
5	CS	Chip select; low when programming, high when not programming; 0–5 V logic level
6	AUX2	Change frequency; toggles between logic low and high with every frequency change
7	AUX1	Bandshift; high selects low frequency VCO; low selects high frequency VCO
8	FIN	Feedback rf input; transmit operating frequency riding on 1.4 V
9	VBBP	DC bias for prescaler input; 1.4 V
10	NC1	Not used
11	NC2	Not used
12	VBB	DC bias for reference divider input; 1.4 V
13	RIN	Reference divider input; 1 Vp-p, 2.1 MHz square wave riding on 1.4 V
14	GND	IC ground; 0 V
15	NC3	Not used
16	NC3	Not used
17	FR	Test point; divided down 2.1 MHz reference @ 6.25 KHz or 5KHz in a locked condition.
18	UP	When locked, narrow (<1 microsecond) down pulses @ 6.25 KHz or 5KHz riding on 0.7 V
19	LOCK	Loop locked; when locked, narrow (<1 microsecond) down pulses @ 6.25 KHz or 5KHz riding on 5 V
20	DOWN	When locked, narrow (<1 microsecond) down pulses @ 6.25 KHz or 5KHz riding on 0.7 V

RECEIVER MODULE

MODEL TRX4014A/CRX4004A



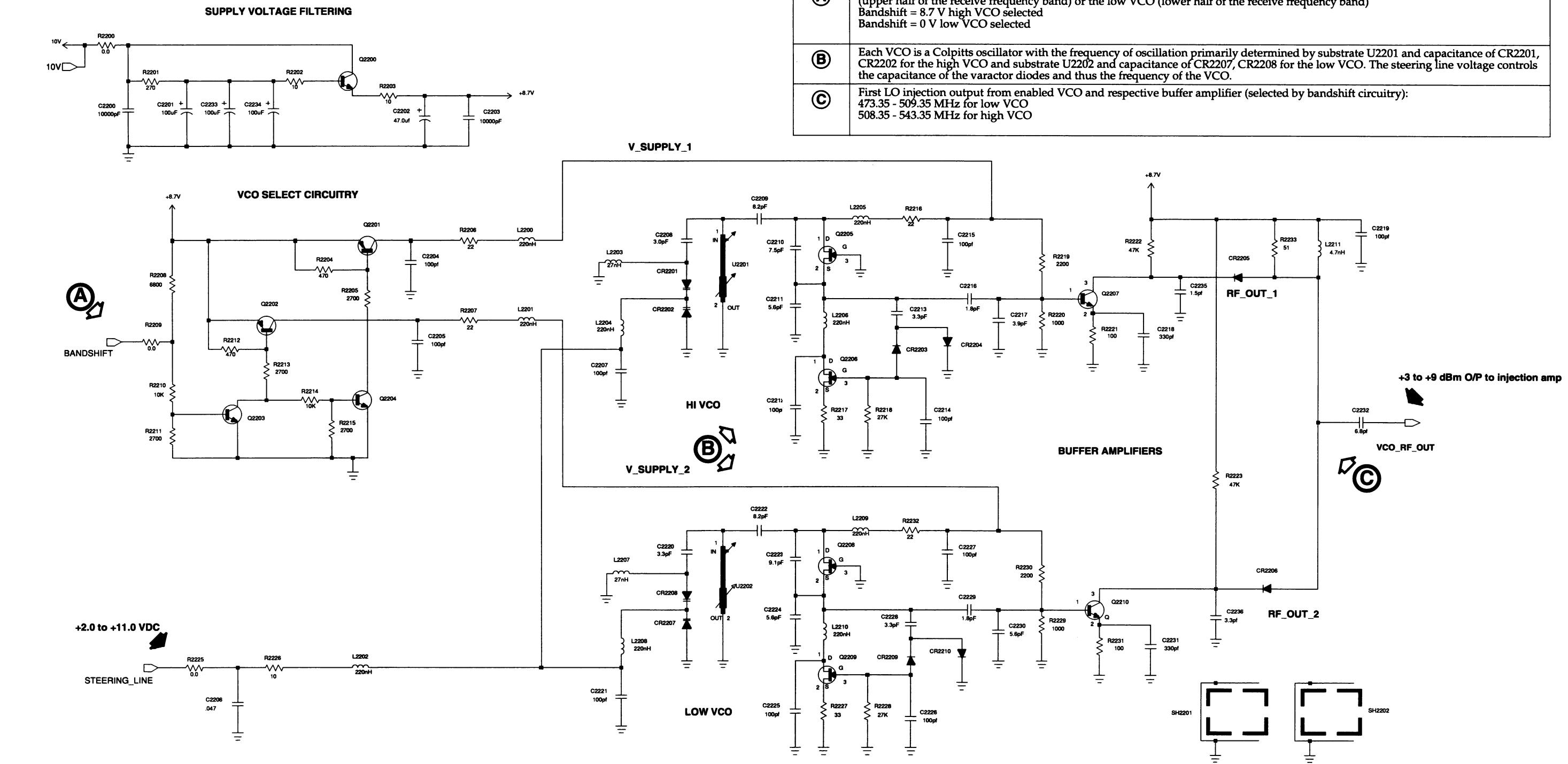
SYNTHESIZER

68P81094E06-A
Schematics (Sheet 13 of 25)
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RECEIVER MODULE
MODEL TRX4014A/CRX4004A

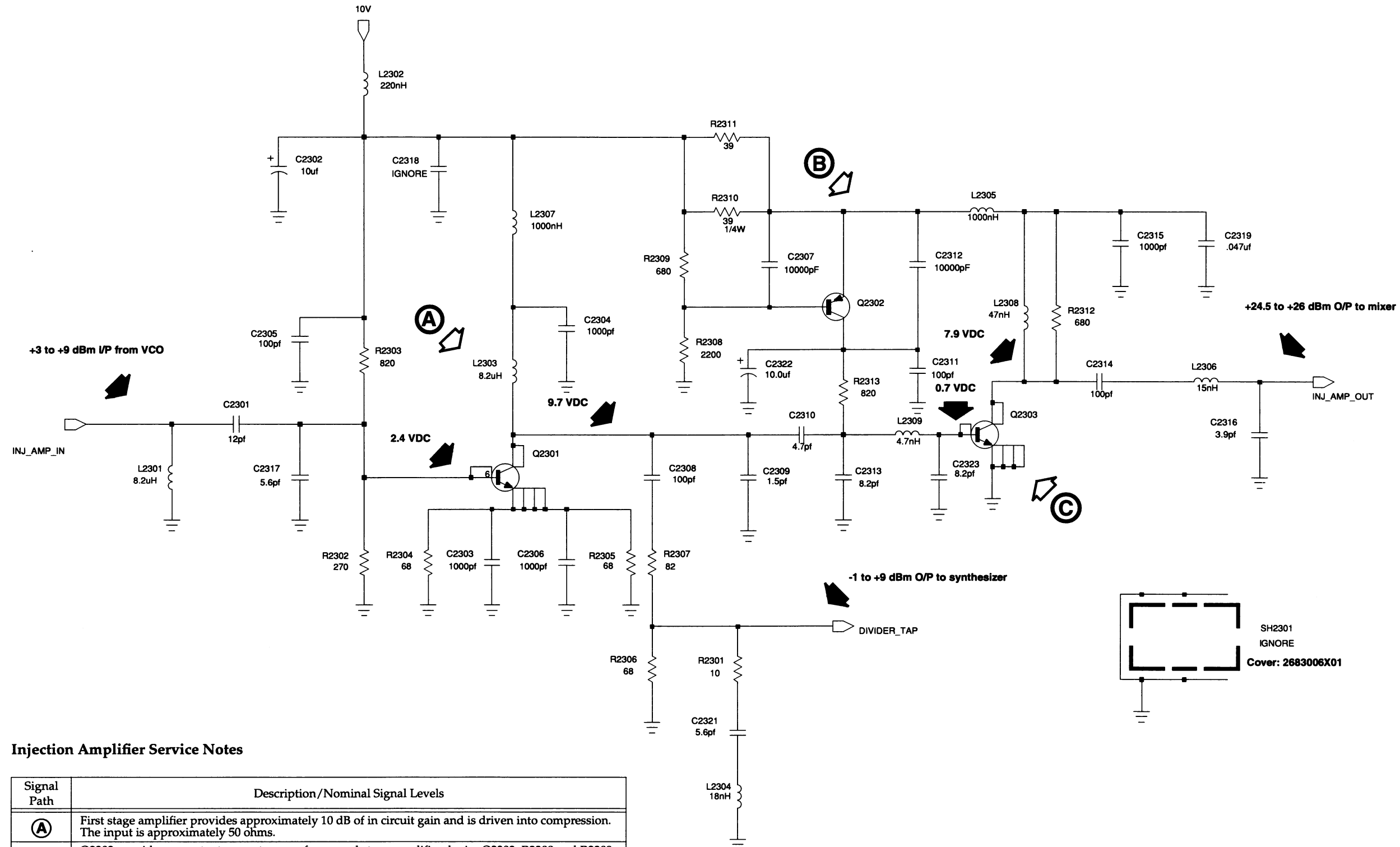
VCO Service Notes

Signal Path	Description/Nominal Signal Levels
(A)	Bandshift signal from synthesizer (U2401-7) controls series passtransistor Q2201 and Q2202 to provide supply voltage to the high VCO (upper half of the receive frequency band) or the low VCO (lower half of the receive frequency band) Bandshift = 8.7 V high VCO selected Bandshift = 0 V low VCO selected
(B)	Each VCO is a Colpitts oscillator with the frequency of oscillation primarily determined by substrate U2201 and capacitance of CR2201, CR2202 for the high VCO and substrate U2202 and capacitance of CR2207, CR2208 for the low VCO. The steering line voltage controls the capacitance of the varactor diodes and thus the frequency of the VCO.
(C)	First LO injection output from enabled VCO and respective buffer amplifier (selected by bandshift circuitry): 473.35 - 509.35 MHz for low VCO 508.35 - 543.35 MHz for high VCO



RECEIVER MODULE

MODEL TRX4014A/CRX4004A

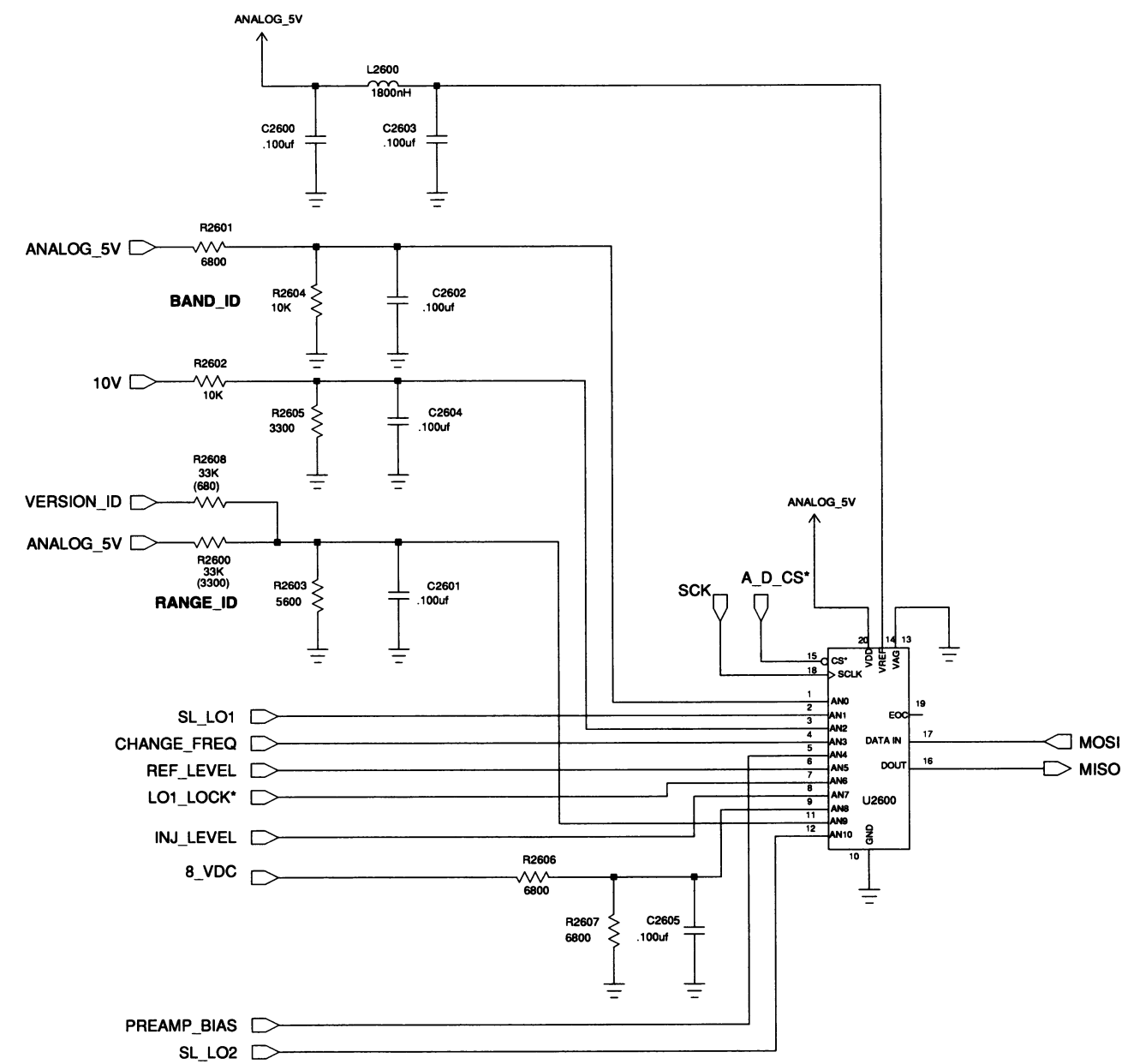


Injection Amplifier Service Notes

Signal Path	Description/Nominal Signal Levels
Ⓐ	First stage amplifier provides approximately 10 dB of in circuit gain and is driven into compression. The input is approximately 50 ohms.
Ⓑ	Q2302 provides a constant current source for second stage amplifier device Q2303. R2308 and R2309 set Q2302 base voltage which in turn determines voltage drop across R2311/R2310 and thus current through R22311/R2310 and collector of Q2303. Typical current through R2311/R2310 is 88 mA DC.
Ⓒ	Second stage amplifier provides approximately 10 dB of incircuit gain and is driven into compression. The output is approximately 50 ohms.

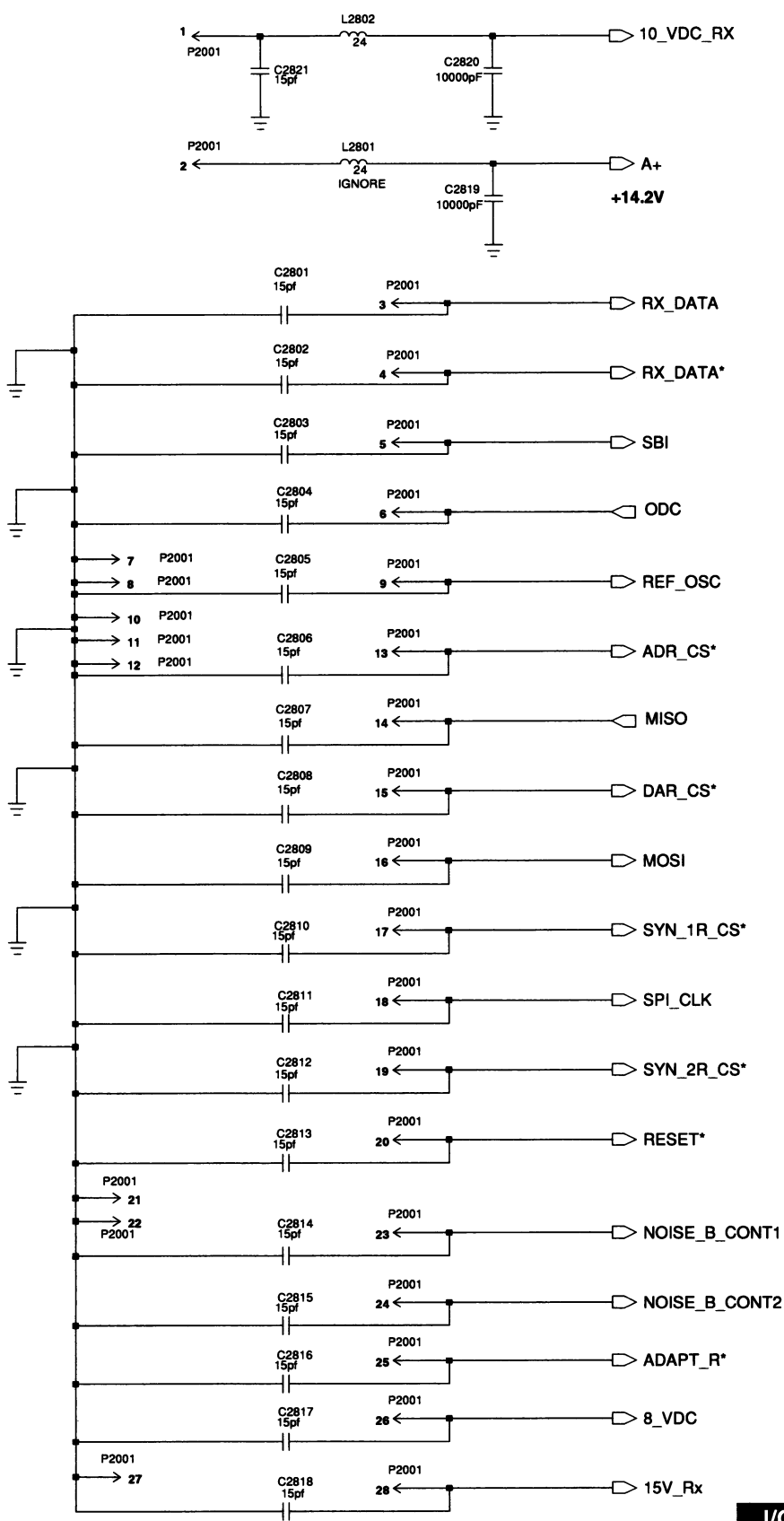
INJECTION AMPLIFIER

RECEIVER MODULE
MODEL TRX4014A/CRX4004A



Note: Component values in brackets are used for CRX4004A.

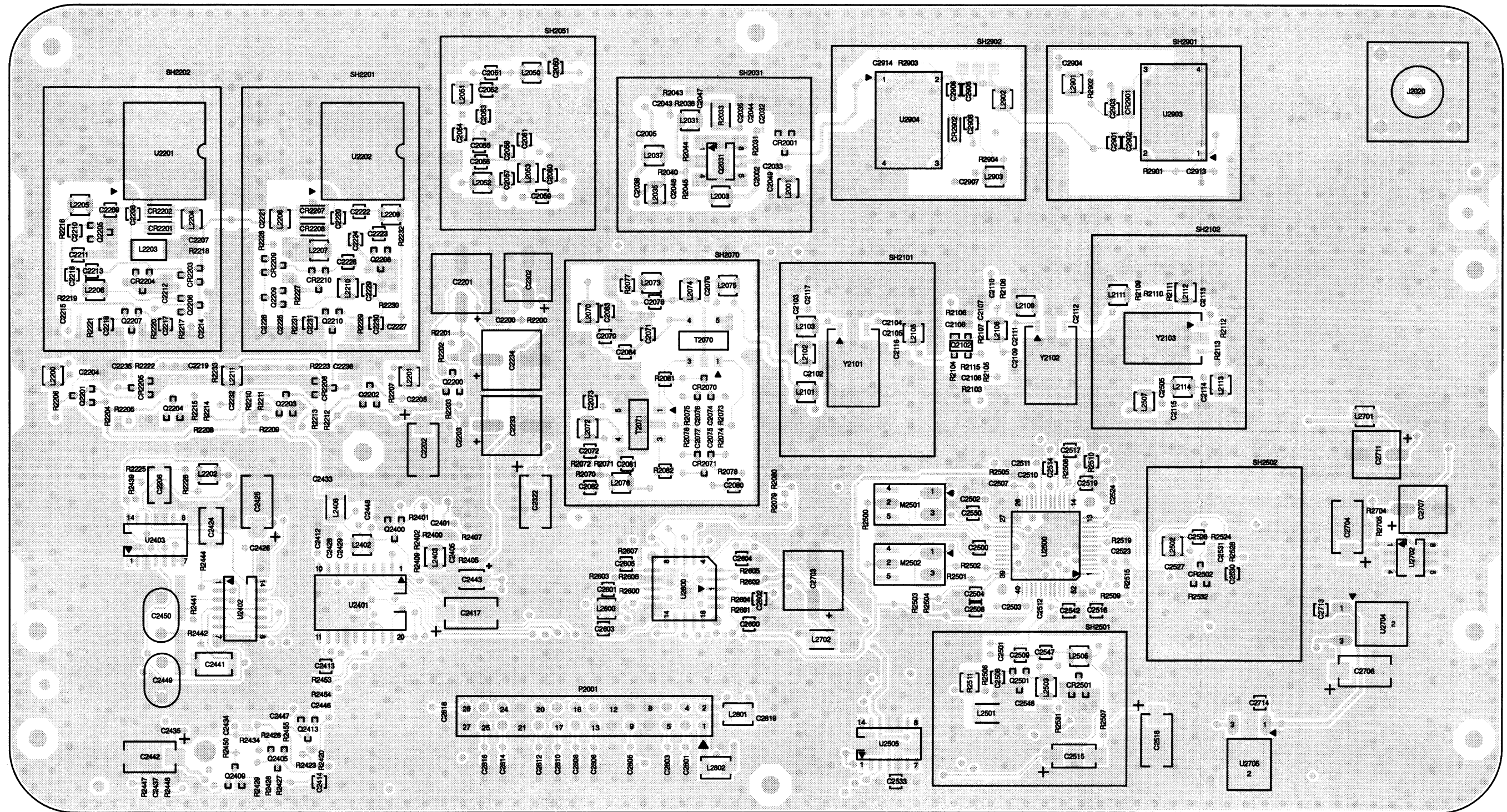
METERING



I/O INTERCONNECT

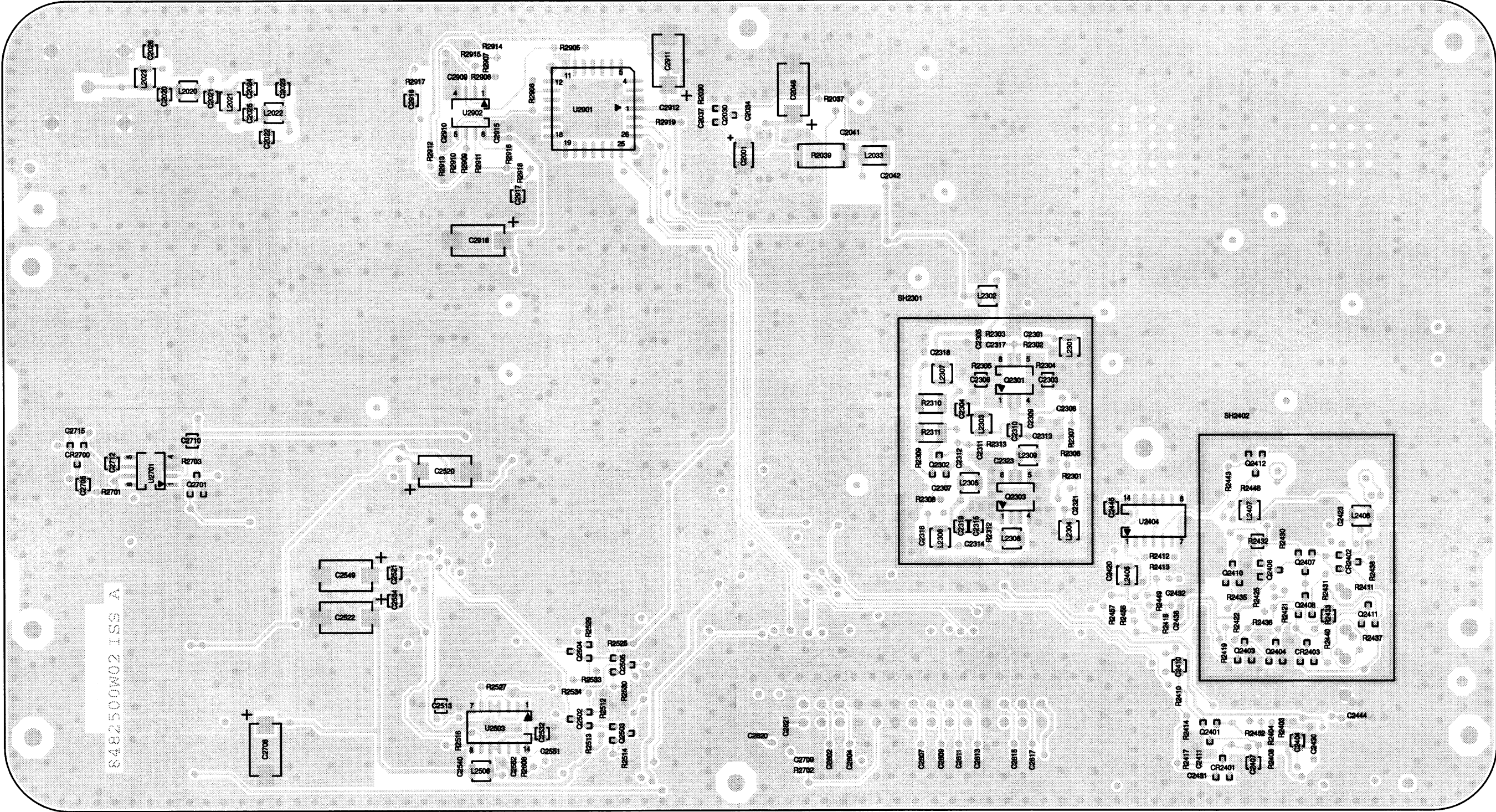
RECEIVER MODULE

MODEL TRX4014A/CRX4004A



UHF RECEIVER BOARD DETAIL HEAVY COMPONENT SIDE

RECEIVER MODULE
MODEL TRX4014A/CRX4004A



Parts List

TRX4014A Receiver Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
TRX4014A RECEIVER UHF R4 W/PRESEL		
		CAPACITOR, FIXED: UF +/-10%; 100 V:
		UNLESS OTHERWISE STATED
C2002	2113740L02	CAP CER CHIP 2.2 PF +/-0.1PF
C2005	2113740F09	1.8 pF, +/-0.1 pF; 50V
C2020 to 2023	2113740G18	4.3 pF, +/-0.1 pF; 50V
C2024	2113740G16	3.6 pF, +/-0.1 pF; 50V
C2025	2113740G17	3.9 pF, +/-0.1 pF; 50V
C2026	2113740G46	47 pF, +/-2%; 50V
C2032	2113740F51	100 pF, +/-5%; 50V
C2033	2113740F28	11 pF, +/-5%; 50V
C2034	2113741F49	0.01 uF, +/-5%; 50V
C2035	2113740F51	100 pF, +/-5%; 50V
C2037	2113741F49	0.01 uF, +/-5%; 50V
C2038	2113741F13	330 pF, +/-5%; 50V
C2041	2113741F49	0.01 uF, +/-5%; 50V
C2043	2113740F51	100 pF, +/-5%; 50V
C2044	2113741F49	0.01 uF, +/-5%; 50V
C2048	2113740F23	6.8 pF, +/-0.25 pF; 50V
C2049	2113740F28	11 pF, +/-5%; 50V
C2050	2113740G27	8.2 pF, +/-0.1 pF; 50V
C2051	2113740G34	16 pF, +/-2 pF; 50V
C2052	2113740G29	10 pF, +/-0.1 pF; 50V
C2053	2113740G19	4.7 pF, +/-0.1 pF; 50V
C2054	2113740G25	7.5 pF, +/-0.1 pF; 50V
C2055	2113740G27	8.2 pF, +/-0.1 pF; 50V
C2056	2113740G18	4.3 pF, +/-0.1 pF; 50V
C2057	2113740G27	8.2 pF, +/-0.1 pF; 50V
C2058	2113740G28	9.1 pF, +/-0.1 pF; 50V
C2059	2113740G34	16 pF, +/-2 pF; 50V
C2060	2113740G28	9.1 pF, +/-0.1 pF; 50V
C2061	2113740G15	3.3 pF, +/-0.1 pF; 50 V
C2070	2113740G35	18 pF, +/-2%; 50V
C2073	2113740G21	5.6 pF, +/-0.1 pF; 50V
C2074 to 2077	2113741F49	0.01 uF, +/-5%; 50V
C2078	2113740G55	100 pF, +/-2%; 50V
C2079	2113740F41	39 pF, +/-5%; 50V
C2080	2113740A71	470 pF, +/-5%; 50 V
C2081	2113740G03	1 pF, +/-0.1 pF; 50 V
C2082	2113740G18	4.3 pF, +/-0.1 pF; 50V
C2083	2113740G30	11 pF, +/-2 pF; 50V
C2084	2113740G31	12 pF, +/-2%; 50V
C2102	2113740F26	9.1 pF, +/-0.25 pF; 50V
C2103	2113740L08	CAP CER CHIP 3.9 PF +/-0.1PF
C2105	2113740F19	4.7 pF, +/-0.25 pF; 50V
C2106 to 2108	2113741F49	0.01 uF, +/-5%; 50V
C2109	2113740F25	8.2 pF, +/-0.25 pF; 50V
C2110	2113741F49	0.01 uF, +/-5%; 50V
C2111	2113740F31	15 pF, +/-5%; 50V
C2112	2113740L01	CAP CER CHIP 2.0 PF +/-0.1PF
C2113	2113740L05	CAP CER CHIP 3.0 PF +/-0.1PF
C2114	2113740L04	CAP CER CHIP 2.7 PF +/-0.1PF
C2116	2113740F06	1.3 pF, +/-0.1 pF; 50V
C2117	2113740L07	CAP CER CHIP 3.6 PF +/-0.1PF
C2200	2113741F49	0.01 uF, +/-5%; 50V
C2201	2380090M36	CAP 100 UF 25V
C2202	2311049A23	47 uF, +/-10%; 10 V
C2203	2113741F49	0.01 uF, +/-5%; 50V
C2204,2205	2113740F51	100 pF, +/-5%; 50V
C2206	0882422W29	CAP FILM SM 0.047UF 63V 5%
C2207	2113740F51	100 pF, +/-5%; 50V
C2208	2113901A16	CAP CHIP HI Q 3.0 PF +/-0.25PF
C2209	2113901A27	CAP CHIP HI Q 8.2 PF +/-0.50PF
C2210	2113901A26	CAP CHIP HI Q 7.5 PF +/-0.50PF
C2211	2113901A23	CAP CHIP HI Q 5.6 PF +/-0.50PF
C2212	2113740F51	100 pF, +/-5%; 50V
C2213	2113901A17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C2214,2215	2113740F51	100 pF, +/-5%; 50V
C2216	2113901A09	CAP CHIP HI Q 1.8 PF +/-0.25PF
C2217	2113901A19	CAP CHIP HI Q 3.9 PF +/-0.25PF
C2218	2113740A67	330 pF, +/-5%; 50 V
C2219	2113740F51	100 pF, +/-5%; 50V
C2220	2113901A17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C2221	2113740F51	100 pF, +/-5%; 50V
C2222	2113901A27	CAP CHIP HI Q 8.2 PF +/-0.50PF
C2223	2113901A28	CAP CHIP HI Q 9.1 PF +/-0.50PF
C2224	2113901A23	CAP CHIP HI Q 5.6 PF +/-0.50PF
C2225 to 2227	2113740F51	100 pF, +/-5%; 50V
C2228	2113901A17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C2229	2113901A09	CAP CHIP HI Q 1.8 PF +/-0.25PF
C2230	2113901A23	CAP CHIP HI Q 5.6 PF +/-0.50PF

TRX4014A Receiver Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C2231	2113740A67	330 pF, +/-5%; 50 V
C2232	2113740F23	6.8 pF, +/-0.25 pF; 50V
C2233,2234	2380090M36	CAP 100 UF 25V
C2235	2113740F07	1.5 pF, +/-0.1 pF; 50V
C2236	2113740F15	3.3 pF, +/-0.25 pF; 50V
C2301	2113740F29	12 pF, +/-5%; 50V
C2302	2380090M24	10 uF, +/-20%; 50 V
C2303,2304	2113740A79	1000 pF, +/-5%; 50 V
C2305	2113740F51	100 pF, +/-5%; 50V
C2306	2113740A79	1000 pF, +/-5%; 50 V
C2307	2113741F49	0.01 uF, +/-5%; 50V
C2308	2113740F51	100 pF, +/-5%; 50V
C2309	2113740F07	1.5 pF, +/-0.1 pF; 50V
C2310	2113740A19	4.7 pF, +/-0.25 pF; 50 V
C2311	2113740F51	100 pF, +/-5%; 50V
C2312	2113741F49	0.01 uF, +/-5%; 50V
C2313	2113740F25	8.2 pF, +/-0.25 pF; 50V
C2314	2113740F51	100 pF, +/-5%; 50V
C2315	2113740A79	1000 pF, +/-5%; 50 V
C2316	2113740L08	CAP CER CHIP 3.9 PF +/-0.1PF
C2317	2113740F21	5.6 pF, +/-0.25 pF; 50V
C2319	2113743A13	0.047 uF, +/-10%; 16V
C2321	2113740F21	5.6 pF, +/-0.25 pF; 50V
C2322	2311049A45	10 uF, +/-10%; 35 V
C2323	2113740F25	8.2 pF, +/-0.25 pF; 50V
C2401	2113740F03	1 pF, +/-0.1 pF; 50V
C2404	2113743A19	0.1 uF, +/-10%; 16V
C2405	2113740F51	100 pF, +/-5%; 50V
C2407	2113743A19	0.1 uF, +/-10%; 16V
C2410	2113743A19	0.1 uF, +/-10%; 16V
C2411	2113741F49	0.01 uF, +/-5%; 50V
C2412	2113740F51	100 pF, +/-5%; 50V
C2413,2414	2113743A19	0.1 uF, +/-10%; 16V
C2417	2311049A45	10 uF, +/-10%; 35 V
C2420	2113740F51	100 pF, +/-5%; 50V
C2423	2113741F49	0.01 uF, +/-5%; 50V
C2424	0882422W28	CAP FILM SM 0.022UF 63V 5%
C2425	2311049A45	10 uF, +/-10%; 35 V
C2426	2113741F49	0.01 uF, +/-5%; 50V
C2428	2113740F21	5.6 pF, +/-0.25 pF; 50V
C2429	2113740F51	100 pF, +/-5%; 50V
C2441	0882422W31	CAP FILM SM 0.22 UF 63V 5%
C2445	2113743A19	0.1 uF, +/-10%; 16V
C2446 to 2448	2113740F51	100 pF, +/-5%; 50V
C2449,2450	0811051A19	1 uF, +/-0.5%; 63 V
C2500	2113743A19	0.1 uF, +/-10%; 16V
C2501	2113740F21	5.6 pF, +/-0.25 pF; 50V
C2502,2503	2113741F49	0.01 uF, +/-5%; 50V
C2504	2113743A19	0.1 uF, +/-10%; 16V
C2505	2113741F49	0.01 uF, +/-5%; 50V
C2506	2113743A19	0.1 uF, +/-10%; 16V
C2507	2113741F49	0.01 uF, +/-5%; 50V
C2508	2113740G41	33 pF, +/-1%; 50V
C2509	2113740G38	24 pF, +/-2%; 50V
C2510,2511	2113741F49	0.01 uF, +/-5%; 50V
C2512	2113740L02	CAP CER CHIP 2.2 PF +/-0.1PF
C2513	2113740A79	1000 pF, +/-5%; 50 V
C2514	2113741A61	0.047 uF, +/-5%; 50 V
C2515	2311049A10	2.2 uF, +/-10%; 35 V
C2516	2113743A19	0.1 uF, +/-10%; 16V
C2517	2113741A57	0.033 uF, +/-5%; 50 V
C2518	2311049A21	22 uF, +/-10%; 20 V
C2519	2113743A19	0.1 uF, +/-10%; 16V
C2520	2311049A45	10 uF, +/-10%; 35 V
C2521	2113743A19	0.1 uF, +/-10%; 16V
C2522	2311049A45	10 uF, +/-10%; 35 V
C2523,2524	2113741F49	0.01 uF, +/-5%; 50V
C2527	2113741F49	0.01 uF, +/-5%; 50V
C2528	2113740A71	470 pF, +/-5%; 50 V
C2530	2113741A53	0.022 uF, +/-5%; 50 V
C2531	2113740F51	100 pF, +/-5%; 50V
C2532 to 2534	2113743A19	0.1 uF, +/-10%; 16V
C2540	2113741F49	0.01 uF, +/-5%; 50V
C2547	2113740G55	100 pF, +/-2%; 50V
C2548	2113741F37	3300 pF, +/-5%; 50V
C2549	2311049A45	10 uF, +/-10%; 35 V
C2550	2113901A16	CAP CHIP HI Q 3.0 PF +/-0.25PF
C2552	2113740F51	100 pF, +/-5%; 50V
C2600 to 2605	2113743A19	0.1 uF, +/-10%; 16V
C2703	2380090M36	CAP 100 UF 25V
C2704	2311049A21	22 uF, +/-10%; 20 V

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TRX4014A Receiver Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C2706	2311049A21	22 uF, +/-10%; 20 V
C2708	2311049A21	22 uF, +/-10%; 20 V
C2713,2714	2113743A19	0.1 uF, +/-10%; 16V
C2801 to 2818	2113740F31	15 pF, +/-5%; 50V
C2819,2820	2113741F49	0.01 uF, +/-5%; 50V
C2821	2113740F31	15 pF, +/-5%; 50V
C2902	2113740G28	9.1 pF, +/-0.1 pF; 50V
C2904	2113740F51	100 pF, +/-5%; 50V
C2906	2113740G28	9.1 pF, +/-0.1 pF; 50V
C2907	2113740F51	100 pF, +/-5%; 50V
C2909,2910	2113740F51	100 pF, +/-5%; 50V
C2911	2311049A45	10 uF, +/-10%; 35 V
C2912	2113740F51	100 pF, +/-5%; 50V
C2915	2113740F51	100 pF, +/-5%; 50V
C2916,2917	2113743A19	0.1 uF, +/-10%; 16V
C2918	2311049A45	10 uF, +/-10%; 35 V
DIODE: (SEE NOTE)		
CR2001	4813833C07	dual 100W
CR2070,2071	4882290T04	Diode; hot carrier
CR2201,2202	4805649Q11	DIODE VCTR ISV 212
CR2203,2204	4813825A05	Hot Carrier
CR2205,2206	4813825A06	Pin,35 V
CR2207,2208	4805649Q11	DIODE VCTR ISV 212
CR2209,2210	4813825A05	Hot Carrier
CR2401	4813825A05	Hot Carrier
CR2402,2403	4813833C10	0.1A, 70 V
CR2501,2502	4813825A01	3V, dual
CR2901,2902	4805649Q11	DIODE VCTR ISV 212
CONNECTOR, RECEPTACLE:		
J2020	0982492W01	BNC CONN PCB VERTICAL RECEPT
COIL, INDUCTOR:		
L2001	2462587X44	IND CHIP LO-PRO 18.0 NH 5%
L2003	2462587X53	IND CHIP LO-PRO 100 NH 5%
L2020 to 2022	2462587X46	IND CHIP LO-PRO 27.0 NH 5%
L2023	2462587X53	IND CHIP LO-PRO 100 NH 5%
L2031	2462587X49	IND CHIP LO-PRO 47.0 NH 5%
L2033	2411087A36	COIL CHIP 6.8 UH 10 A/P
L2035	2462587R17	Chip; inductor; 8.2 NH 5%
L2037	2462587X41	IND CHIP LO-PRO 10.0 NH 5%
L2050 to 2053	2462587X44	IND CHIP LO-PRO 18.0 NH 5%
L2070	2462587X42	IND CHIP LO-PRO 12.0 NH 5%
L2072	2462587X42	IND CHIP LO-PRO 12.0 NH 5%
L2073	2462587X49	IND CHIP LO-PRO 47.0 NH 5%
L2074,2075	2462587X47	IND CHIP LO-PRO 33.0 NH 5%
L2076	2462587X42	IND CHIP LO-PRO 12.0 NH 5%
L2101	2462587X55	IND CHIP LO-PRO 150 NH 5%
L2102	2462587X59	IND CHIP LO-PRO 330 NH 5%
L2103	2462587X68	IND CHIP LO-PRO 1,000 NH 5%
L2105	2462587X68	IND CHIP LO-PRO 1,000 NH 5%
L2108	2462587N71	1800 nH, +/-5%
L2109	2462587X64	IND CHIP LO-PRO 680 NH 5%
L2111	2462587X67	IND CHIP LO-PRO 910 NH 5%
L2112	2462587X68	IND CHIP LO-PRO 1,000 NH 5%
L2113	2462587X59	IND CHIP LO-PRO 330 NH 5%
L2114	2462587X67	IND CHIP LO-PRO 910 NH 5%
L2200 to 2202	2462587X57	CHIP IND lopro 220 NH 5%
L2203	2460591E73	COIL AIR WOUNDINDUC 27.53
L2204 to 2206	2462587X57	CHIP IND lopro 220 NH 5%
L2207	2462587X46	IND CHIP LO-PRO 27.0 NH 5%
L2208 to 2210	2462587X57	CHIP IND lopro 220 NH 5%
L2211	2462587R16	4.7 nH, +/-5%
L2301	2462587R17	Chip; inductor; 8.2 NH 5%
L2302	2462587X57	CHIP IND lopro 220 NH 5%
L2303	2462587R17	Chip; inductor; 8.2 NH 5%
L2304	2462587X44	IND CHIP LO-PRO 18.0 NH 5%
L2305	2462587X68	IND CHIP LO-PRO 1,000 NH 5%
L2306	2462587X43	IND CHIP LO-PRO 15.0 NH 5%
L2307	2462587X68	IND CHIP LO-PRO 1,000 NH 5%
L2308	2462587X49	IND CHIP LO-PRO 47.0 NH 5%
L2309	2462587R16	4.7 nH, +/-5%
L2402	2462587X43	IND CHIP LO-PRO 15.0 NH 5%
L2403	2462587X57	CHIP IND lopro 220 NH 5%
L2405 to 2407	2462587X57	CHIP IND lopro 220 NH 5%
L2408	2411087A54	220 uH, +/-10%
L2501	2411087B32	Chip 3.3 UH 5 A/I
L2502	2462587N71	1800 nH, +/-5%
L2503	2413923A03	IND CHIP 82 NH 2%
L2505	2462587N72	2200 NH, +/-5%

TRX4014A Receiver Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
L2506,2507	2462587X57	CHIP IND lopro 220 NH 5%
L2600	2462587N71	1800 nH, +/-5%
L2702	2411087A23	0.56 UH
L2802	2484657R01	ferrite bead
L2902	2462587X53	IND CHIP LO-PRO 100 NH 5%
METER:		
M2501,2502	9185128U02	FLTR L-C 450KC LCF- 450
CONNECTOR, PLUG:		
P2001	2882982X01	HDR 2 X 14 VERT
TRANSISTOR: (SEE NOTE)		
Q2030	4813824A17	PNP
Q2031	4813827A24	TSTR NPN SML SIG MRF5812 5812
Q2102	4885228U05	TSTR GAAS DL GATE MESFET_U73_
Q2200	4813824A10	NPN
Q2201,2202	4813824A17	PNP
Q2203,2204	4813824A10	NPN
Q2205,2206	4880141L06	MOSFET
Q2207	4813827A03	NPN
Q2208,2209	4880141L06	MOSFET
Q2210	4813827A03	NPN
Q2301	4813827A26	Transistor; NPN
Q2302	4813824A17	PNP
Q2303	4813827A26	Transistor; NPN
Q2400	4813827A03	NPN
Q2401	4813824A10	NPN
Q2403,2404	4813824A10	NPN
Q2405	4813824A17	PNP
Q2406,2407	4813824A10	NPN
Q2408	4813824A17	PNP
Q2409,2410	4813824A10	NPN
Q2411	4813824A17	PNP
Q2412,2413	4813824A10	NPN
Q2501	4813823A06	Transistor; J-FET
Q2502 to 2505	4813824A10	NPN
RESISTOR, FIXED: +/-5%; 1/16 W:		
UNLESS OTHERWISE STATED		
R2030	0662057A67	CHIP RES 5600 OHMS
R2031	0662057A49	CHIP RES 1000 OHMS
R2033	0611072A09	22 ohms, 1/4 W
R2036	0662057A65	CHIP RES 4700 OHMS
R2037	0662057A59	CHIP RES 2700 OHMS
R2039	0683962T37	33 ohms, 1W
R2040	0662057A27	CHIP RES 120 OHMS
R2043	0662057A65	CHIP RES 4700 OHMS
R2044	0662057A18	CHIP RES 51 OHMS
R2045	0662057A41	CHIP RES 470 OHMS
R2070	0662057A41	CHIP RES 470 OHMS
R2071	0662057A01	CHIP RES 10 OHMS
R2072	0662057A41	CHIP RES 470 OHMS
R2073 to 2076	0662057A31	CHIP RES 180 OHMS
R2077	0611079A42	47 ohms, 1/10 W
R2078	0662057A61	CHIP RES 3300 OHMS
R2079	0662057A49	CHIP RES 1000 OHMS
R2080	0662057A73	CHIP RES 10K OHMS
R2081,2082	0611079A01	0 ohms, 1/10 W
R2103	0662057A49	CHIP RES 1000 OHMS
R2104	0662057A59	CHIP RES 2700 OHMS
R2105	0662057A57	CHIP RES 2200 OHMS
R2106	0662057A23	CHIP RES 82 OHMS
R2107	0662057A41	CHIP RES 470 OHMS
R2108	0662057A33	CHIP RES 220 OHMS
R2109	0662057A65	CHIP RES 4700 OHMS
R2110	0662057A37	CHIP RES 330 OHMS
R2111	0662057A65	CHIP RES 4700 OHMS
R2115	0662057A25	CHIP RES 100 OHMS
R2200	0662057B47	CHIP RES 0 OHMS +/- .050 OHMS
R2201	0662057A35	CHIP RES 270 OHMS
R2202,2203	0662057A01	CHIP RES 10 OHMS
R2204	0662057A41	CHIP RES 470 OHMS
R2205	0662057A59	CHIP RES 2700 OHMS
R2206,2207	0662057A09	CHIP RES 22 OHMS
R2208	0662057A69	CHIP RES 6800 OHMS
R2209	0662057B47	CHIP RES 0 OHMS +/- .050 OHMS
R2210	0662057A73	CHIP RES 10K OHMS
R2211	0662057A59	CHIP RES 2700 OHMS
R2212	0662057A41	CHIP RES 470 OHMS
R2213	0662057A59	CHIP RES 2700 OHMS

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TRX4014A Receiver Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R2214	0662057A73	CHIP RES 10K OHMS
R2215	0662057A59	CHIP RES 2700 OHMS
R2216	0662057A09	CHIP RES 22 OHMS
R2217	0662057A13	CHIP RES 33 OHMS
R2218	0662057A83	CHIP RES 27K OHMS
R2219	0662057A57	CHIP RES 2200 OHMS
R2220	0662057A49	CHIP RES 1000 OHMS
R2221	0662057A25	CHIP RES 100 OHMS
R2222,2223	0662057A89	CHIP RES 47K OHMS
R2225	0662057B47	CHIP RES 0 OHMS $\pm .050$ OHMS
R2226	0662057A01	CHIP RES 10 OHMS
R2227	0662057A13	CHIP RES 33 OHMS
R2228	0662057A83	CHIP RES 27K OHMS
R2229	0662057A49	CHIP RES 1000 OHMS
R2230	0662057A57	CHIP RES 2200 OHMS
R2231	0662057A25	CHIP RES 100 OHMS
R2232	0662057A09	CHIP RES 22 OHMS
R2233	0662057A18	CHIP RES 51 OHMS
R2301	0662057A01	CHIP RES 10 OHMS
R2302	0662057A35	CHIP RES 270 OHMS
R2303	0662057A47	CHIP RES 820 OHMS
R2304 to 2306	0662057A21	CHIP RES 68 OHMS
R2307	0662057A23	CHIP RES 82 OHMS
R2308	0662057A57	CHIP RES 2200 OHMS
R2309	0662057A45	CHIP RES 680 OHMS
R2310,2311	0611072A15	39 ohms, 1/4W
R2312	0662057A45	CHIP RES 680 OHMS
R2313	0662057A47	CHIP RES 820 OHMS
R2400	0662057A57	CHIP RES 2200 OHMS
R2401	0662057A75	CHIP RES 12K OHMS
R2402	0662057A59	CHIP RES 2700 OHMS
R2403,2404	0662057A57	CHIP RES 2200 OHMS
R2405	0662057A41	CHIP RES 470 OHMS
R2407	0662057A17	CHIP RES 47 OHMS
R2408	0662057A11	CHIP RES 27 OHMS
R2409	0662057A17	CHIP RES 47 OHMS
R2410	0662057A25	CHIP RES 100 OHMS
R2411	0662057A61	CHIP RES 3300 OHMS
R2413	0662057A97	CHIP RES 100K OHMS
R2414	0662057A47	CHIP RES 820 OHMS
R2417	0662057A73	CHIP RES 10K OHMS
R2418	0662057A67	CHIP RES 5600 OHMS
R2419	0662057A49	CHIP RES 1000 OHMS
R2420	0662057A73	CHIP RES 10K OHMS
R2421	0662057A61	CHIP RES 3300 OHMS
R2422	0662057A49	CHIP RES 1000 OHMS
R2423	0662057A73	CHIP RES 10K OHMS
R2425	0662057A49	CHIP RES 1000 OHMS
R2426	0662057A25	CHIP RES 100 OHMS
R2427	0662057A73	CHIP RES 10K OHMS
R2428,2429	0662057A89	CHIP RES 47K OHMS
R2430,2431	0662057A73	CHIP RES 10K OHMS
R2432,2433	0611079A26	10 ohms, 1/10 W
R2434	0662057A67	CHIP RES 5600 OHMS
R2435	0662057A73	CHIP RES 10K OHMS
R2436	0662057A63	CHIP RES 3900 OHMS
R2437	0662057A73	CHIP RES 10K OHMS
R2438	0662057A37	CHIP RES 330 OHMS
R2439	0662057A67	CHIP RES 5600 OHMS
R2440	0662057A37	CHIP RES 330 OHMS
R2441	0662057A43	CHIP RES 560 OHMS
R2442	0662057A77	CHIP RES 15K OHMS
R2443	0662057A73	CHIP RES 10K OHMS
R2444	0662057A67	CHIP RES 5600 OHMS
R2446,2447	0662057A73	CHIP RES 10K OHMS
R2448	0662057A65	CHIP RES 4700 OHMS
R2449,2450	0662057B47	CHIP RES 0 OHMS $\pm .050$ OHMS
R2452	0662057A49	CHIP RES 1000 OHMS
R2453,2454	0662057A65	CHIP RES 4700 OHMS
R2455	0662057A73	CHIP RES 10K OHMS
R2456	0662057B47	CHIP RES 0 OHMS $\pm .050$ OHMS
R2500	0662057A13	CHIP RES 33 OHMS
R2501,2502	0662057A21	CHIP RES 68 OHMS
R2503	0662057A11	CHIP RES 27 OHMS
R2504	0662057A57	CHIP RES 2200 OHMS
R2505	0662057A11	CHIP RES 27 OHMS
R2506,2507	0662057A37	CHIP RES 330 OHMS
R2508	0662057B08	CHIP RES 270K OHMS
R2509	0662057A11	CHIP RES 27 OHMS
R2510	0611079A21	6.2 ohms, 1/10 W
R2511	0680149M01	470 ohms, $\pm 10\%$; 240 MW

TRX4014A Receiver Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R2512	0662057A37	CHIP RES 330 OHMS
R2513	0662057A73	CHIP RES 10K OHMS
R2514	0662057A09	CHIP RES 22 OHMS
R2515	0662057A17	CHIP RES 47 OHMS
R2516	0662057A21	CHIP RES 68 OHMS
R2519	0662057A69	CHIP RES 6800 OHMS
R2524,2525	0662057A73	CHIP RES 10K OHMS
R2527	0662057A21	CHIP RES 68 OHMS
R2528	0662057A85	CHIP RES 33K OHMS
R2529	0662057A37	CHIP RES 330 OHMS
R2530	0662057A09	CHIP RES 22 OHMS
R2531	0662057A17	CHIP RES 47 OHMS
R2532	0662057B47	CHIP RES 0 OHMS $\pm .050$ OHMS
R2600	0662057A85	CHIP RES 33K OHMS
R2601	0662057A69	CHIP RES 6800 OHMS
R2602	0662057A73	CHIP RES 10K OHMS
R2603	0662057A67	CHIP RES 5600 OHMS
R2604	0662057A73	CHIP RES 10K OHMS
R2605	0662057A61	CHIP RES 3300 OHMS
R2606,2607	0662057A69	CHIP RES 6800 OHMS
R2608	0662057A85	CHIP RES 33K OHMS
R2705	0662057B47	CHIP RES 0 OHMS $\pm .050$ OHMS
R2902	0662057A57	CHIP RES 2200 OHMS
R2904	0662057A57	CHIP RES 2200 OHMS
R2905	0662057A65	CHIP RES 4700 OHMS
R2906	0662057A77	CHIP RES 15K OHMS
R2907	0662057A73	CHIP RES 10K OHMS
R2908	0662057A65	CHIP RES 4700 OHMS
R2909	0662057A77	CHIP RES 15K OHMS
R2910	0662057A73	CHIP RES 10K OHMS
R2911	0662057B47	CHIP RES 0 OHMS $\pm .050$ OHMS
R2912	0662057A63	CHIP RES 3900 OHMS
R2913	0662057A49	CHIP RES 1000 OHMS
R2914	0662057A63	CHIP RES 3900 OHMS
R2915	0662057A49	CHIP RES 1000 OHMS
R2917,2918	0662057A49	CHIP RES 1000 OHMS
R2919	0662057A97	CHIP RES 100K OHMS
		SHIELD:
SH2201,2202	2682680X01	SHIELD VCO
		TRANSFORMER:
T2070,2071	2584600T01	Balun; RF
		INTEGRATED CIRCUIT: (SEE NOTE)
U2201	5182665X01	RESONATOR, VCO, 509-543MHZ
U2202	5182666X01	RESONATOR, VCO, 476-510MHZ
U2401	5184602T03	IC
U2402	5113806A21	Quad Analog Switch Multiplexer
U2403	5113819A08	Low Power
U2404	5113805A18	Dual D-Type Flip-Flop with Set/Reset
U2500	5184523T08	IC ABACUS JEDEZ 52QFP
U2503	5113805A08	Triple 3-Input AND Gate
U2505	5113819A08	Low Power
U2600	5113811A08	IC; 8-bit
U2704,2705	5113816A07	5-Volt Positive Regulator
U2901	5180057S02	IC CMOS CUST DA CONV 13" REEL
U2902	5113818A14	IC DL OP AMP RAIL TO RAIL
U2903,2904	5182525W01	RESONATOR, PRESELECTOR, UHF
		CRYSTAL: (SEE NOTE)
Y2101	4805846W06	XTAL FLTR 73.35M IM W CLIP
Y2102,2103	4805846W08	XTAL FLTR 73.35M W CLIP
		NON-REFERENCED ITEMS
	1583004X02	CORRAL LARGE (used with SH2070)
	2683006X01	COVER LARGE (used with SH2070)

Note: For optimum performance, diodes, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

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Parts List

CRX4004A Receiver Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
CRX4004A RECIEVER, UHF, R4 W/O PRESEL		
		CAPACITOR, FIXED: UF +/-10%; 100 V:
		UNLESS OTHERWISE STATED
C2002	2113740L02	CAP CER CHIP 2.2 PF +0.1PF
C2005	2113740F09	1.8 pF, +/-0.1 pF; 50V
C2020 to 2023	2113740G18	4.3 pF, +/-0.1 pF; 50V
C2024	2113740G16	3.6 pF, +/-0.1 pF; 50V
C2025	2113740G17	3.9 pF, +/-0.1 pF; 50V
C2026	2113740G46	47 pF, +/-2%; 50V
C2032	2113740F51	100 pF, +/-5%; 50V
C2033	2113740F28	11 pF, +/-5%; 50V
C2034	2113741F49	0.01 uF, +/-5%; 50V
C2035	2113740F51	100 pF, +/-5%; 50V
C2037	2113741F49	0.01 uF, +/-5%; 50V
C2038	2113741F13	330 pF, +/-5%; 50V
C2041	2113741F49	0.01 uF, +/-5%; 50V
C2043	2113740F51	100 pF, +/-5%; 50V
C2044	2113741F49	0.01 uF, +/-5%; 50V
C2048	2113740F23	6.8 pF, +/-0.25 pF; 50V
C2049	2113740F28	11 pF, +/-5%; 50V
C2050	2113740G27	8.2 pF, +/-0.1 pF; 50V
C2051	2113740G34	16 pF, +/-2 pF; 50V
C2052	2113740G29	10 pF, +/-0.1 pF; 50V
C2053	2113740G19	4.7 pF, +/-0.1 pF; 50V
C2054	2113740G25	7.5 pF, +/-0.1 pF; 50V
C2055	2113740G27	8.2 pF, +/-0.1 pF; 50V
C2056	2113740G18	4.3 pF, +/-0.1 pF; 50V
C2057	2113740G27	8.2 pF, +/-0.1 pF; 50V
C2058	2113740G28	9.1 pF, +/-0.1 pF; 50V
C2059	2113740G34	16 pF, +/-2 pF; 50V
C2060	2113740G28	9.1 pF, +/-0.1 pF; 50V
C2061	2113740G15	3.3 pF, +/-0.1 pF; 50 V
C2070	2113740G35	18 pF, +/-2%; 50V
C2073	2113740G21	5.6 pF, +/-0.1 pF; 50V
C2074 to 2077	2113741F49	0.01 uF, +/-5%; 50V
C2078	2113740G55	100 pF, +/-2%; 50V
C2079	2113740F41	39 pF, +/-5%; 50V
C2080	2113740A71	470 pF, +/-5%; 50 V
C2081	2113740G03	1 pF, +/-0.1 pF; 50 V
C2082	2113740G18	4.3 pF, +/-0.1 pF; 50V
C2083	2113740G30	11 pF, +/-2 pF; 50V
C2084	2113740G31	12 pF, +/-2%; 50V
C2102	2113740F26	9.1 pF, +/-0.25 pF; 50V
C2103	2113740L08	CAP CER CHIP 3.9 PF +0.1PF
C2105	2113740F19	4.7 pF, +/-0.25 pF; 50V
C2106 to 2108	2113741F49	0.01 uF, +/-5%; 50V
C2109	2113740F25	8.2 pF, +/-0.25 pF; 50V
C2110	2113741F49	0.01 uF, +/-5%; 50V
C2111	2113740F31	15 pF, +/-5%; 50V
C2112	2113740L01	CAP CER CHIP 2.0 PF +0.1PF
C2113	2113740L05	CAP CER CHIP 3.0 PF +0.1PF
C2114	2113740L04	CAP CER CHIP 2.7 PF +0.1PF
C2116	2113740F06	1.3 pF, +/-0.1 pF; 50V
C2117	2113740L07	CAP CER CHIP 3.6 PF +0.1PF
C2200	2113741F49	0.01 uF, +/-5%; 50V
C2201	2380090M36	CAP 100 UF 25V
C2202	2311049A23	47 uF, +/-10%; 10 V
C2203	2113741F49	0.01 uF, +/-5%; 50V
C2204,2205	2113740F51	100 pF, +/-5%; 50V
C2206	0882422W29	CAP FILM SM 0.047UF 63V 5%
C2207	2113740F51	100 pF, +/-5%; 50V
C2208	2113901A16	CAP CHIP HI Q 3.0 PF +/-0.25PF
C2209	2113901A27	CAP CHIP HI Q 8.2 PF +/-0.50PF
C2210	2113901A26	CAP CHIP HI Q 7.5 PF +/-0.50PF
C2211	2113901A23	CAP CHIP HI Q 5.6 PF +/-0.50PF
C2212	2113740F51	100 pF, +/-5%; 50V
C2213	2113901A17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C2214,2215	2113740F51	100 pF, +/-5%; 50V
C2216	2113901A09	CAP CHIP HI Q 1.8 PF +/-0.25PF
C2217	2113901A19	CAP CHIP HI Q 3.9 PF +/-0.25PF
C2218	2113740A67	330 pF, +/-5%; 50 V
C2219	2113740F51	100 pF, +/-5%; 50V
C2220	2113901A17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C2221	2113740F51	100 pF, +/-5%; 50V
C2222	2113901A27	CAP CHIP HI Q 8.2 PF +/-0.50PF
C2223	2113901A28	CAP CHIP HI Q 9.1 PF +/-0.50PF
C2224	2113901A23	CAP CHIP HI Q 5.6 PF +/-0.50PF
C2225 to 2227	2113740F51	100 pF, +/-5%; 50V
C2228	2113901A17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C2229	2113901A09	CAP CHIP HI Q 1.8 PF +/-0.25PF
C2230	2113901A23	CAP CHIP HI Q 5.6 PF +/-0.50PF

CRX4004A Receiver Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C2231	2113740A67	330 pF, +/-5%; 50 V
C2232	2113740F23	6.8 pF, +/-0.25 pF; 50V
C2233,2234	2380090M36	CAP 100 UF 25V
C2235	2113740F07	1.5 pF, +/-0.1 pF; 50V
C2236	2113740F15	3.3 pF, +/-0.25 pF; 50V
C2301	2113740F29	12 pF, +/-5%; 50V
C2302	2380090M24	10 uF, +/-20%; 50 V
C2303,2304	2113740A79	1000 pF, +/-5%; 50 V
C2305	2113740F51	100 pF, +/-5%; 50V
C2306	2113740A79	1000 pF, +/-5%; 50 V
C2307	2113741F49	0.01 uF, +/-5%; 50V
C2308	2113740F51	100 pF, +/-5%; 50V
C2309	2113740F07	1.5 pF, +/-0.1 pF; 50V
C2310	2113740A19	4.7 pF, +/-0.25 pF; 50 V
C2311	2113740F51	100 pF, +/-5%; 50V
C2312	2113741F49	0.01 uF, +/-5%; 50V
C2313	2113740F25	8.2 pF, +/-0.25 pF; 50V
C2314	2113740F51	100 pF, +/-5%; 50V
C2315	2113740A79	1000 pF, +/-5%; 50 V
C2316	2113740L08	CAP CER CHIP 3.9 PF +0.1PF
C2317	2113740F21	5.6 pF, +/-0.25 pF; 50V
C2319	2113743A13	0.047 uF, +/-10%; 16V
C2321	2113740F21	5.6 pF, +/-0.25 pF; 50V
C2322	2311049A45	10 uF, +/-10%; 35 V
C2323	2113740F25	8.2 pF, +/-0.25 pF; 50V
C2401	2113740F03	1 pF, +/-0.1 pF; 50V
C2404	2113743A19	0.1 uF, +/-10%; 16V
C2405	2113740F51	100 pF, +/-5%; 50V
C2407	2113743A19	0.1 uF, +/-10%; 16V
C2410	2113743A19	0.1 uF, +/-10%; 16V
C2411	2113741F49	0.01 uF, +/-5%; 50V
C2412	2113740F51	100 pF, +/-5%; 50V
C2413,2414	2113743A19	0.1 uF, +/-10%; 16V
C2417	2311049A45	10 uF, +/-10%; 35 V
C2420	2113740F51	100 pF, +/-5%; 50V
C2423	2113741F49	0.01 uF, +/-5%; 50V
C2424	0882422W28	CAP FILM SM 0.022UF 63V 5%
C2425	2311049A45	10 uF, +/-10%; 35 V
C2426	2113741F49	0.01 uF, +/-5%; 50V
C2428	2113740F21	5.6 pF, +/-0.25 pF; 50V
C2429	2113740F51	100 pF, +/-5%; 50V
C2441	0882422W31	CAP FILM SM 0.22 UF 63V 5%
C2445	2113743A19	0.1 uF, +/-10%; 16V
C2446 to 2448	2113740F51	100 pF, +/-5%; 50V
C2449,2450	0811051A19	1 uF, +5%/-0.5%; 63 V
C2500	2113743A19	0.1 uF, +/-10%; 16V
C2501	2113740F21	5.6 pF, +/-0.25 pF; 50V
C2502,2503	2113741F49	0.01 uF, +/-5%; 50V
C2504	2113743A19	0.1 uF, +/-10%; 16V
C2505	2113741F49	0.01 uF, +/-5%; 50V
C2506	2113743A19	0.1 uF, +/-10%; 16V
C2507	2113741F49	0.01 uF, +/-5%; 50V
C2508	2113740G41	33 pF, +/-1%; 50V
C2509	2113740G38	24 pF, +/-2%; 50V
C2510,2511	2113741F49	0.01 uF, +/-5%; 50V
C2512	2113740L02	CAP CER CHIP 2.2 PF +0.1PF
C2513	2113740A79	1000 pF, +/-5%; 50 V
C2514	2113741A61	0.047 uF, +/-5%; 50 V
C2515	2311049A10	2.2 uF, +/-10%; 35 V
C2516	2113743A19	0.1 uF, +/-10%; 16V
C2517	2113741A57	0.033 uF, +/-5%; 50 V
C2518	2311049A21	22 uF, +/-10%; 20 V
C2519	2113743A19	0.1 uF, +/-10%; 16V
C2520	2311049A45	10 uF, +/-10%; 35 V
C2521	2113743A19	0.1 uF, +/-10%; 16V
C2522	2311049A45	10 uF, +/-10%; 35 V
C2523,2524	2113741F49	0.01 uF, +/-5%; 50V
C2527	2113741F49	0.01 uF, +/-5%; 50V
C2528	2113740A71	470 pF, +/-5%; 50 V
C2530	2113741A53	0.022 uF, +/-5%; 50 V
C2531	2113740F51	100 pF, +/-5%; 50V
C2532 to 2534	2113743A19	0.1 uF, +/-10%; 16V
C2540	2113741F49	0.01 uF, +/-5%; 50V
C2547	2113740G55	100 pF, +/-2%; 50V
C2548	2113741F37	3300 pF, +/-5%; 50V
C2549	2311049A45	10 uF, +/-10%; 35 V
C2550	2113901A16	CAP CHIP HI Q 3.0 PF +/-0.25PF
C2552	2113740F51	100 pF, +/-5%; 50V
C2600 to 2605	2113743A19	0.1 uF, +/-10%; 16V
C2703	2380090M36	CAP 100 UF 25V
C2704	2311049A21	22 uF, +/-10%; 20 V

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CRX4004A Receiver Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C2706	2311049A21	22 uF, +/-10%; 20 V
C2708	2311049A21	22 uF, +/-10%; 20 V
C2713,2714	2113743A19	0.1 uF, +/-10%; 16V
C2801 to 2818	2113740F31	15 pF, +/-5%; 50V
C2819,2820	2113741F49	0.01 uF, +/-5%; 50V
C2821	2113740F31	15 pF, +/-5%; 50V
C2902	2113740G17	3.9 pF, +/-0.1 pF; 50V
C2903	2113740G55	100 pF, +/-2%; 50V
C2906	2113740G18	4.3 pF, +/-0.1 pF; 50V
C2908	2113740G55	100 pF, +/-2%; 50V
C2911	2311049A45	10 uF, +/-10%; 35 V
C2912	2113740F51	100 pF, +/-5%; 50V
C2913	2113740F03	1 pF, +/-0.1 pF; 50V
C2914	2113740F07	1.5 pF, +/-0.1 pF; 50V
C2915	2113740F51	100 pF, +/-5%; 50V
C2918	2311049A45	10 uF, +/-10%; 35 V
DIODE: (SEE NOTE)		
CR2001	4813833C07	dual 100W
CR2070,2071	4882290T04	Diode; hot carrier
CR2201,2202	4805649Q11	DIODE VCTR ISV 212
CR2203,2204	4813825A05	Hot Carrier
CR2205,2206	4813825A06	Pin,35 V
CR2207,2208	4805649Q11	DIODE VCTR ISV 212
CR2209,2210	4813825A05	Hot Carrier
CR2401	4813825A05	Hot Carrier
CR2402,2403	4813833C10	0.1A, 70 V
CR2501,2502	4813825A01	3V, dual
CONNECTOR, RECEPTACLE:		
J2020	0982492W01	BNC CONN PCB VERTICAL RECEPT
COIL, INDUCTOR:		
L2001	2462587X44	IND CHIP LO-PRO 18.0 NH 5%
L2003	2462587X53	IND CHIP LO-PRO 100 NH 5%
L2020 to 2022	2462587X46	IND CHIP LO-PRO 27.0 NH 5%
L2023	2462587X53	IND CHIP LO-PRO 100 NH 5%
L2031	2462587X49	IND CHIP LO-PRO 47.0 NH 5%
L2033	2411087A36	COIL CHIP 6.8 UH 10 A/P
L2035	2462587R17	Chip; inductor; 8.2 NH 5%
L2037	2462587X41	IND CHIP LO-PRO 10.0 NH 5%
L2050 to 2053	2462587X44	IND CHIP LO-PRO 18.0 NH 5%
L2070	2462587X42	IND CHIP LO-PRO 12.0 NH 5%
L2072	2462587X42	IND CHIP LO-PRO 12.0 NH 5%
L2073	2462587X49	IND CHIP LO-PRO 47.0 NH 5%
L2074,2075	2462587X47	IND CHIP LO-PRO 33.0 NH 5%
L2076	2462587X42	IND CHIP LO-PRO 12.0 NH 5%
L2101	2462587X55	IND CHIP LO-PRO 150 NH 5%
L2102	2462587X59	IND CHIP LO-PRO 330 NH 5%
L2103	2462587X68	IND CHIP LO-PRO 1,000 NH 5%
L2105	2462587X68	IND CHIP LO-PRO 1,000 NH 5%
L2108	2462587N71	1800 nH, +/-5%
L2109	2462587X64	IND CHIP LO-PRO 680 NH 5%
L2111	2462587X67	IND CHIP LO-PRO 910 NH 5%
L2112	2462587X68	IND CHIP LO-PRO 1,000 NH 5%
L2113	2462587X59	IND CHIP LO-PRO 330 NH 5%
L2114	2462587X67	IND CHIP LO-PRO 910 NH 5%
L2200 to 2202	2462587X57	CHIP IND lopro 220 NH 5%
L2203	2460591E73	COIL AIR WOUNDINDUC 27.53
L2204 to 2206	2462587X57	CHIP IND lopro 220 NH 5%
L2207	2462587X46	IND CHIP LO-PRO 27.0 NH 5%
L2208 to 2210	2462587X57	CHIP IND lopro 220 NH 5%
L2211	2462587R16	4.7 nH, +/-5%
L2301	2462587R17	Chip; inductor; 8.2 NH 5%
L2302	2462587X57	CHIP IND lopro 220 NH 5%
L2303	2462587R17	Chip; inductor; 8.2 NH 5%
L2304	2462587X44	IND CHIP LO-PRO 18.0 NH 5%
L2305	2462587X68	IND CHIP LO-PRO 1,000 NH 5%
L2306	2462587X43	IND CHIP LO-PRO 15.0 NH 5%
L2307	2462587X68	IND CHIP LO-PRO 1,000 NH 5%
L2308	2462587X49	IND CHIP LO-PRO 47.0 NH 5%
L2309	2462587R16	4.7 nH, +/-5%
L2402	2462587X43	IND CHIP LO-PRO 15.0 NH 5%
L2403	2462587X57	CHIP IND lopro 220 NH 5%
L2405 to 2407	2462587X57	CHIP IND lopro 220 NH 5%
L2408	2411087A54	220 uH, +/-10%
L2501	2411087B32	Chip 3.3 UH 5 A/I
L2502	2462587N71	1800 nH, +/-5%
L2503	2413923A03	IND CHIP 82 NH 2%
L2505	2462587N72	2200 NH, +/-5%
L2506,2507	2462587X57	CHIP IND lopro 220 NH 5%

CRX4004A Receiver Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
L2600	2462587N71	1800 nH, +/-5%
L2702	2411087A23	0.56 UH
L2802	2484657R01	ferite bead
L2902	2462587R16	4.7 nH, +/-5%
METER:		
M2501,2502	9185128U02	FLTR L-C 450KC LCF- 450
CONNECTOR, PLUG:		
P2001	2882982X01	HDR 2 X 14 VERT
TRANSISTOR: (SEE NOTE)		
Q2030	4813824A17	PNP
Q2031	4813827A24	TSTR NPN SML SIG MRF5812 5812
Q2102	4885228U05	TSTR GAAS DL GATE MESFET_U73_
Q2200	4813824A10	NPN
Q2201,2202	4813824A17	PNP
Q2203,2204	4813824A10	NPN
Q2205,2206	4880141L06	MOSFET
Q2207	4813827A03	NPN
Q2208,2209	4880141L06	MOSFET
Q2210	4813827A03	NPN
Q2301	4813827A26	Transistor; NPN
Q2302	4813824A17	PNP
Q2303	4813827A26	Transistor; NPN
Q2400	4813827A03	NPN
Q2401	4813824A10	NPN
Q2403,2404	4813824A10	NPN
Q2405	4813824A17	PNP
Q2406,2407	4813824A10	NPN
Q2408	4813824A17	PNP
Q2409,2410	4813824A10	NPN
Q2411	4813824A17	PNP
Q2412,2413	4813824A10	NPN
Q2501	4813823A06	Transistor; J-FET
Q2502 to 2505	4813824A10	NPN
RESISTOR, FIXED: +/-5%; 1/16 W:		
UNLESS OTHERWISE STATED		
R2030	0662057A67	CHIP RES 5600 OHMS
R2031	0662057A49	CHIP RES 1000 OHMS
R2033	0611072A09	22 ohms, 1/4 W
R2036	0662057A65	CHIP RES 4700 OHMS
R2037	0662057A59	CHIP RES 2700 OHMS
R2039	0683962T37	33 ohms, 1W
R2040	0662057A27	CHIP RES 120 OHMS
R2043	0662057A65	CHIP RES 4700 OHMS
R2044	0662057A18	CHIP RES 51 OHMS
R2045	0662057A41	CHIP RES 470 OHMS
R2070	0662057A41	CHIP RES 470 OHMS
R2071	0662057A01	CHIP RES 10 OHMS
R2072	0662057A41	CHIP RES 470 OHMS
R2073 to 2076	0662057A31	CHIP RES 180 OHMS
R2077	0611079A42	47 ohms, 1/10 W
R2078	0662057A61	CHIP RES 3300 OHMS
R2079	0662057A49	CHIP RES 1000 OHMS
R2080	0662057A73	CHIP RES 10K OHMS
R2081,2082	0611079A01	0 ohms, 1/10 W
R2103	0662057A49	CHIP RES 1000 OHMS
R2104	0662057A59	CHIP RES 2700 OHMS
R2105	0662057A57	CHIP RES 2200 OHMS
R2106	0662057A23	CHIP RES 82 OHMS
R2107	0662057A41	CHIP RES 470 OHMS
R2108	0662057A33	CHIP RES 220 OHMS
R2109	0662057A65	CHIP RES 4700 OHMS
R2110	0662057A37	CHIP RES 330 OHMS
R2111	0662057A65	CHIP RES 4700 OHMS
R2115	0662057A25	CHIP RES 100 OHMS
R2200	0662057B47	CHIP RES 0 OHMS +/-0.050 OHMS
R2201	0662057A35	CHIP RES 270 OHMS
R2202,2203	0662057A01	CHIP RES 10 OHMS
R2204	0662057A41	CHIP RES 470 OHMS
R2205	0662057A59	CHIP RES 2700 OHMS
R2206,2207	0662057A09	CHIP RES 22 OHMS
R2208	0662057A69	CHIP RES 6800 OHMS
R2209	0662057B47	CHIP RES 0 OHMS +/-0.050 OHMS
R2210	0662057A73	CHIP RES 10K OHMS
R2211	0662057A59	CHIP RES 2700 OHMS
R2212	0662057A41	CHIP RES 470 OHMS
R2213	0662057A59	CHIP RES 2700 OHMS
R2214	0662057A73	CHIP RES 10K OHMS

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CRX4004A Receiver Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R2215	0662057A59	CHIP RES 2700 OHMS
R2216	0662057A09	CHIP RES 22 OHMS
R2217	0662057A13	CHIP RES 33 OHMS
R2218	0662057A83	CHIP RES 27K OHMS
R2219	0662057A57	CHIP RES 2200 OHMS
R2220	0662057A49	CHIP RES 1000 OHMS
R2221	0662057A25	CHIP RES 100 OHMS
R2222,2223	0662057A89	CHIP RES 47K OHMS
R2225	0662057B47	CHIP RES 0 OHMS \pm .050 OHMS
R2226	0662057A01	CHIP RES 10 OHMS
R2227	0662057A13	CHIP RES 33 OHMS
R2228	0662057A83	CHIP RES 27K OHMS
R2229	0662057A49	CHIP RES 1000 OHMS
R2230	0662057A57	CHIP RES 2200 OHMS
R2231	0662057A25	CHIP RES 100 OHMS
R2232	0662057A09	CHIP RES 22 OHMS
R2233	0662057A18	CHIP RES 51 OHMS
R2301	0662057A01	CHIP RES 10 OHMS
R2302	0662057A35	CHIP RES 270 OHMS
R2303	0662057A47	CHIP RES 820 OHMS
R2304 to 2306	0662057A21	CHIP RES 68 OHMS
R2307	0662057A23	CHIP RES 82 OHMS
R2308	0662057A57	CHIP RES 2200 OHMS
R2309	0662057A45	CHIP RES 680 OHMS
R2310,2311	0611072A15	39 ohms, 1/4W
R2312	0662057A45	CHIP RES 680 OHMS
R2313	0662057A47	CHIP RES 820 OHMS
R2400	0662057A57	CHIP RES 2200 OHMS
R2401	0662057A75	CHIP RES 12K OHMS
R2402	0662057A59	CHIP RES 2700 OHMS
R2403,2404	0662057A57	CHIP RES 2200 OHMS
R2405	0662057A41	CHIP RES 470 OHMS
R2407	0662057A17	CHIP RES 47 OHMS
R2408	0662057A11	CHIP RES 27 OHMS
R2409	0662057A17	CHIP RES 47 OHMS
R2410	0662057A25	CHIP RES 100 OHMS
R2411	0662057A61	CHIP RES 3300 OHMS
R2413	0662057A97	CHIP RES 100K OHMS
R2414	0662057A47	CHIP RES 820 OHMS
R2417	0662057A73	CHIP RES 10K OHMS
R2418	0662057A67	CHIP RES 5600 OHMS
R2419	0662057A49	CHIP RES 1000 OHMS
R2420	0662057A73	CHIP RES 10K OHMS
R2421	0662057A61	CHIP RES 3300 OHMS
R2422	0662057A49	CHIP RES 1000 OHMS
R2423	0662057A73	CHIP RES 10K OHMS
R2425	0662057A49	CHIP RES 1000 OHMS
R2426	0662057A25	CHIP RES 100 OHMS
R2427	0662057A73	CHIP RES 10K OHMS
R2428,2429	0662057A89	CHIP RES 47K OHMS
R2430,2431	0662057A73	CHIP RES 10K OHMS
R2432,2433	0611079A26	10 ohms, 1/10 W
R2434	0662057A67	CHIP RES 5600 OHMS
R2435	0662057A73	CHIP RES 10K OHMS
R2436	0662057A63	CHIP RES 3900 OHMS
R2437	0662057A73	CHIP RES 10K OHMS
R2438	0662057A37	CHIP RES 330 OHMS
R2439	0662057A67	CHIP RES 5600 OHMS
R2440	0662057A37	CHIP RES 330 OHMS
R2441	0662057A43	CHIP RES 560 OHMS
R2442	0662057A77	CHIP RES 15K OHMS
R2443	0662057A73	CHIP RES 10K OHMS
R2444	0662057A67	CHIP RES 5600 OHMS
R2446,2447	0662057A73	CHIP RES 10K OHMS
R2448	0662057A65	CHIP RES 4700 OHMS
R2449,2450	0662057B47	CHIP RES 0 OHMS \pm .050 OHMS
R2452	0662057A49	CHIP RES 1000 OHMS
R2453,2454	0662057A65	CHIP RES 4700 OHMS
R2455	0662057A73	CHIP RES 10K OHMS
R2456	0662057B47	CHIP RES 0 OHMS \pm .050 OHMS
R2500	0662057A13	CHIP RES 33 OHMS
R2501,2502	0662057A21	CHIP RES 68 OHMS
R2503	0662057A11	CHIP RES 27 OHMS
R2504	0662057A57	CHIP RES 2200 OHMS
R2505	0662057A11	CHIP RES 27 OHMS
R2506,2507	0662057A37	CHIP RES 330 OHMS
R2508	0662057B08	CHIP RES 270K OHMS
R2509	0662057A11	CHIP RES 27 OHMS
R2510	0611079A21	6.2 ohms, 1/10 W
R2511	0680149M01	470 ohms, \pm 10%; 240 MW
R2512	0662057A37	CHIP RES 330 OHMS

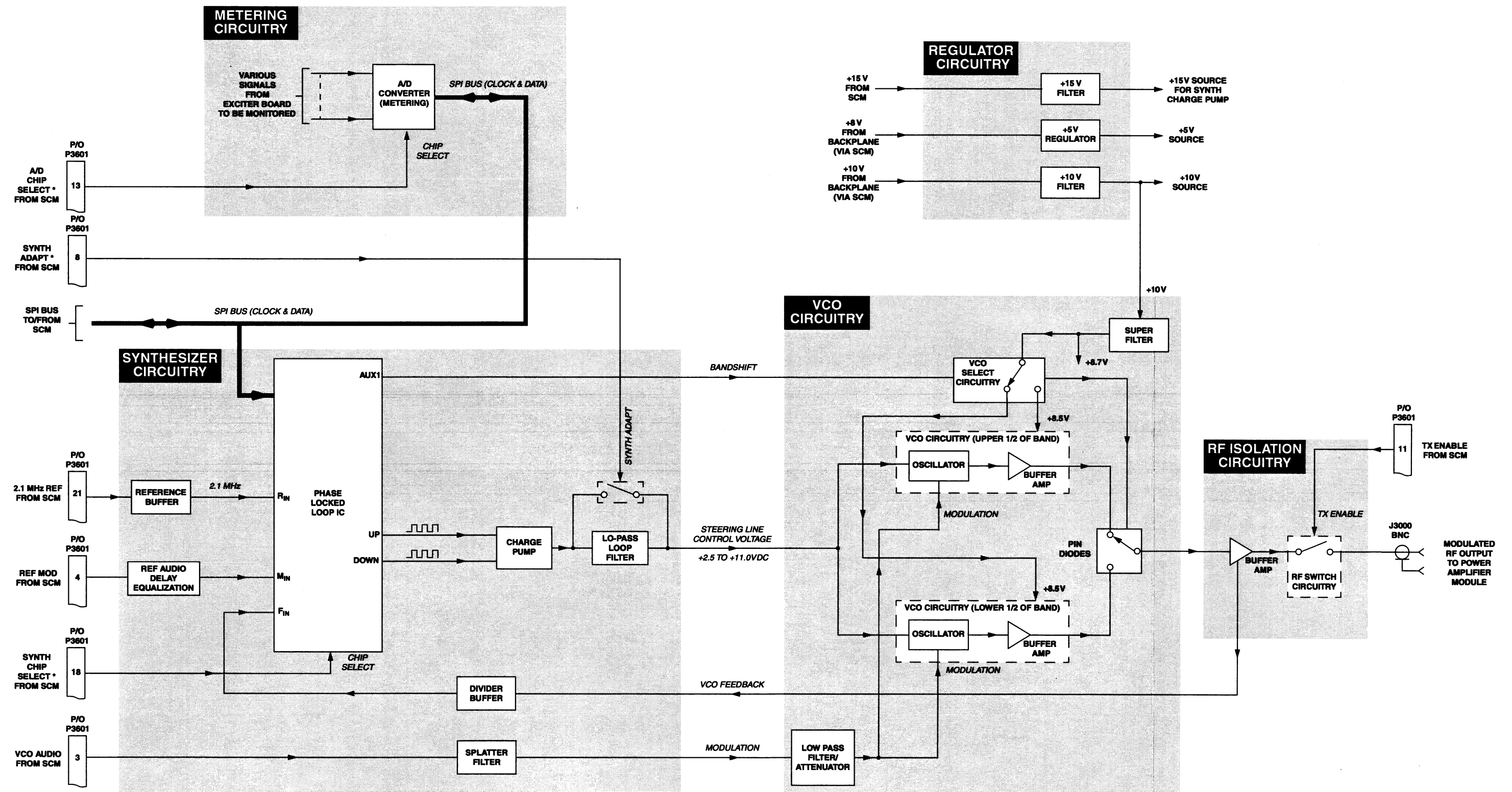
CRX4004A Receiver Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R2513	0662057A73	CHIP RES 10K OHMS
R2514	0662057A09	CHIP RES 22 OHMS
R2515	0662057A17	CHIP RES 47 OHMS
R2516	0662057A21	CHIP RES 68 OHMS
R2519	0662057A69	CHIP RES 6800 OHMS
R2524,2525	0662057A73	CHIP RES 10K OHMS
R2527	0662057A21	CHIP RES 68 OHMS
R2528	0662057A85	CHIP RES 33K OHMS
R2529	0662057A37	CHIP RES 330 OHMS
R2530	0662057A09	CHIP RES 22 OHMS
R2531	0662057A17	CHIP RES 47 OHMS
R2532	0662057B47	CHIP RES 0 OHMS \pm .050 OHMS
R2600	0662057A61	CHIP RES 3300 OHMS
R2601	0662057A69	CHIP RES 6800 OHMS
R2602	0662057A73	CHIP RES 10K OHMS
R2603	0662057A49	CHIP RES 1000 OHMS
R2604	0662057A73	CHIP RES 10K OHMS
R2605	0662057A61	CHIP RES 3300 OHMS
R2606,2607	0662057A69	CHIP RES 6800 OHMS
R2608	0662057A45	CHIP RES 680 OHMS
R2705	0662057B47	CHIP RES 0 OHMS \pm .050 OHMS
R2901	0662057B47	CHIP RES 0 OHMS \pm .050 OHMS
R2903	0662057B47	CHIP RES 0 OHMS \pm .050 OHMS
		SHIELD:
SH2201,2202	2682680X01	SHIELD VCO
		TRANSFORMER:
T2070,2071	2584600T01	Balun; RF
		INTEGRATED CIRCUIT: (SEE NOTE)
U2201	5182665X01	RESONATOR, VCO, 509-543MHZ
U2202	5182666X01	RESONATOR, VCO, 476-510MHZ
U2401	5184602T03	IC
U2402	5113806A21	Quad Analog Switch Multiplexer
U2403	5113819A08	Low Power
U2404	5113805A18	Dual D-Type Flip-Flop with Set/Reset
U2500	5184523T08	IC ABACUS JEDEZ 52QFP
U2503	5113805A08	Triple 3-Input AND Gate
U2505	5113819A08	Low Power
U2600	5113811A08	IC; 8-bit
U2704,2705	5113816A07	5-Volt Positive Regulator
		CRYSTAL: (SEE NOTE)
Y2101	4805846W06	XTAL FLTR 73.35M IM W CLIP
Y2102,2103	4805846W08	XTAL FLTR 73.35M W CLIP
		NON-REFERENCED ITEMS
	1583004X02	CORRAL LARGE (used with SH2070)
	2683006X01	COVER LARGE (used with SH2070)

Note: For optimum performance, diodes, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

EXCITER MODULE

MODEL TTX4014A

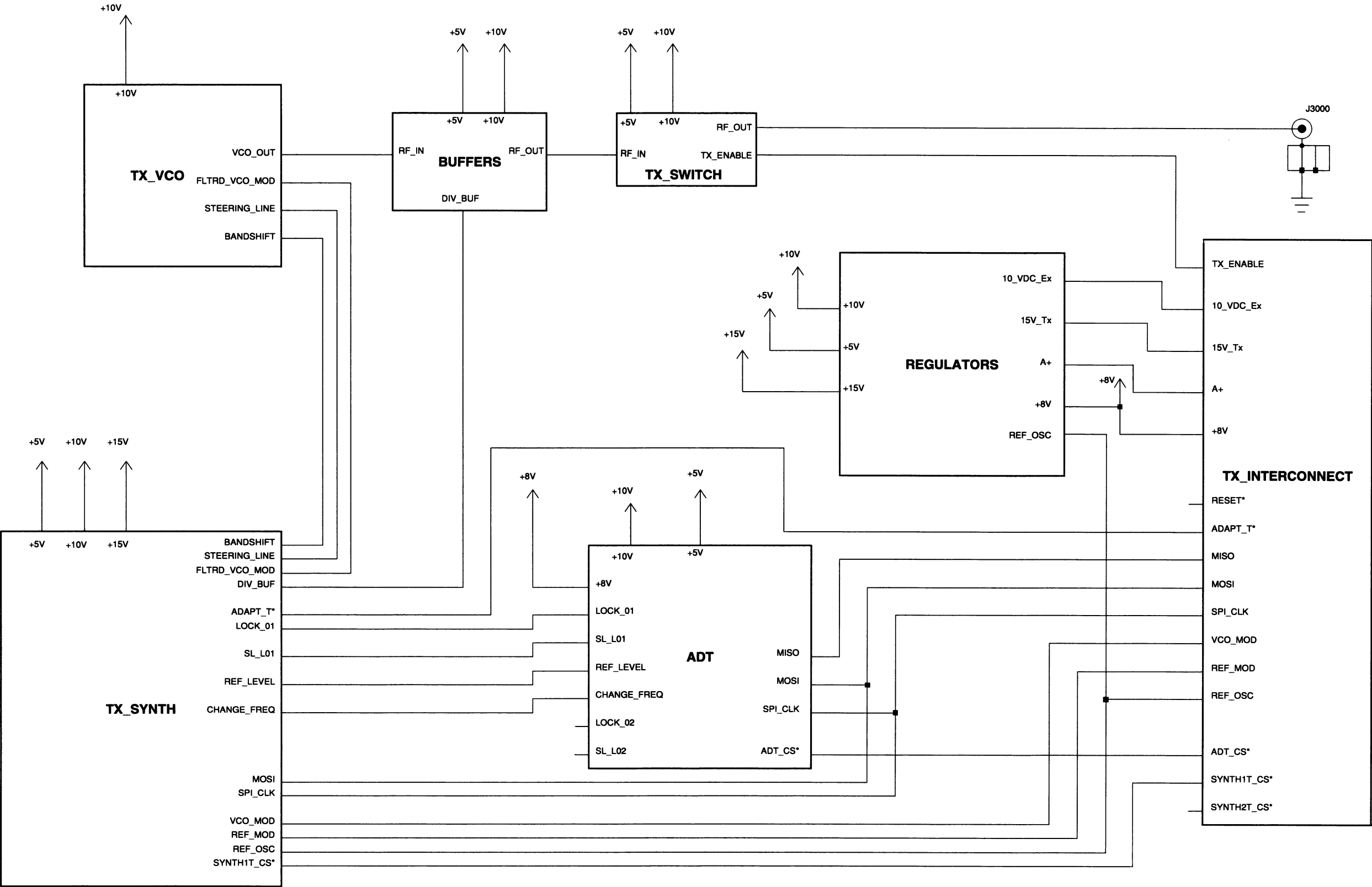


UHF EXCITER FUNCTIONAL BLOCK DIAGRAM

EXCITER MODULE
MODEL TTX4014A

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EXCITER MODULE
MODEL TTX4014A



UHF EXCITER MODULE BLOCK DIAGRAM

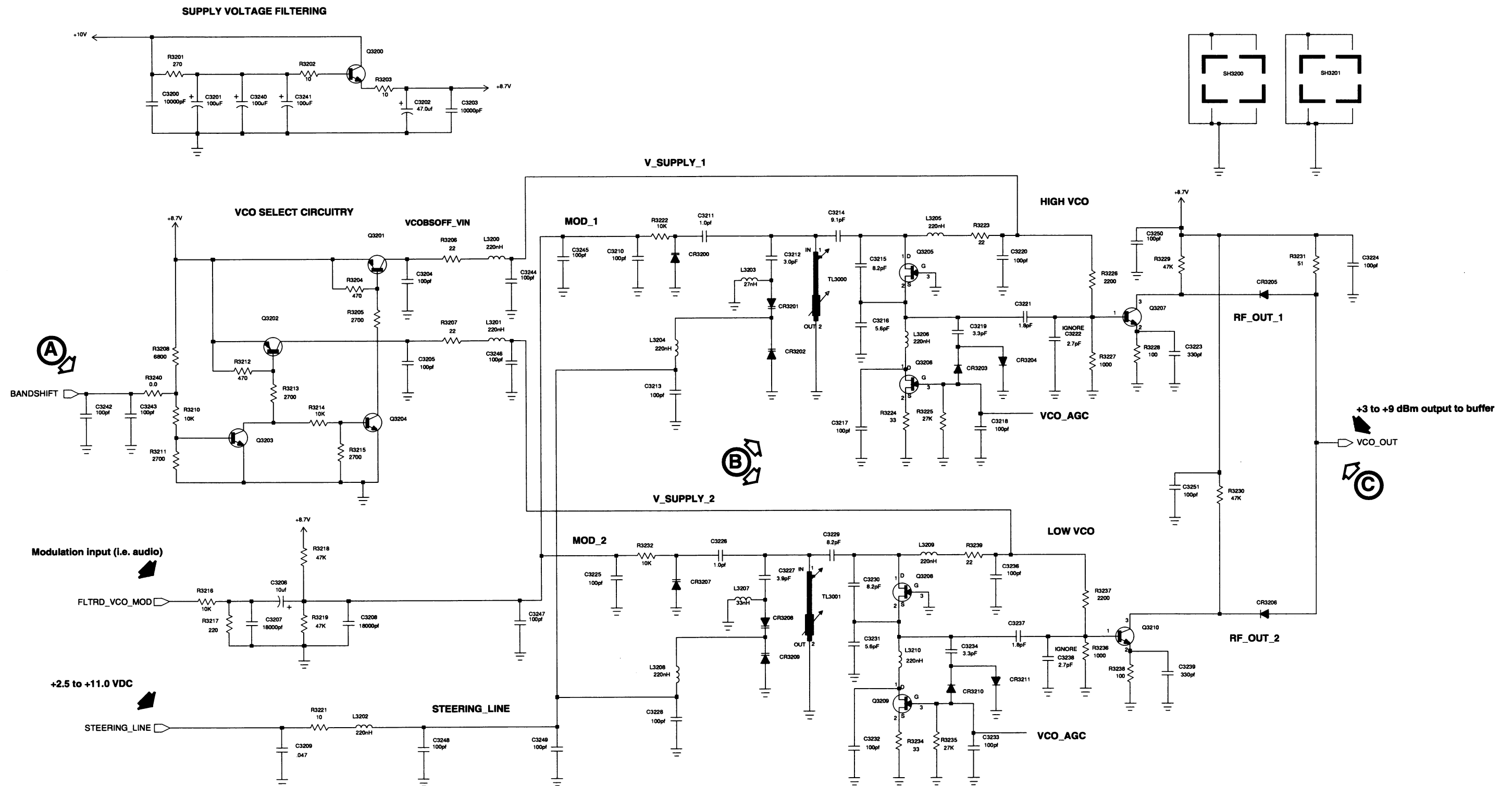
EXCITER MODULE
MODEL TTX4014A

VCO Service Notes

Signal Path	Description/Nominal Signal Levels
Ⓐ	Bandshift signal from synthesizer (U3402-7) controls series pass transistor Q3201 and Q3202 to provide supply voltage to the high VCO (upper half of the transmit frequency band) or the low VCO (lower half of the transmit frequency band) Bandshift = 0 V high VCO selected Bandshift = 5 V low VCO selected
Ⓑ	Each VCO is a Colpitts oscillator with the frequency of oscillation primarily determined by substrate TL3000 and capacitance of CR3201, CR3202 for the high VCO and substrate TL3001 and capacitance of CR3208, CR3209 for the low VCO. The steering line voltage controls the capacitance of the varactor diodes and thus the frequency of the VCO.
Ⓒ	Output by enabled VCO sent to buffer amplifier. (selected by bandshift circuitry): 403 - 436 MHz for low VCO 437 - 470 MHz for high VCO

EXCITER MODULE

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EXCITER MODULE
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Synthesizer Service Notes

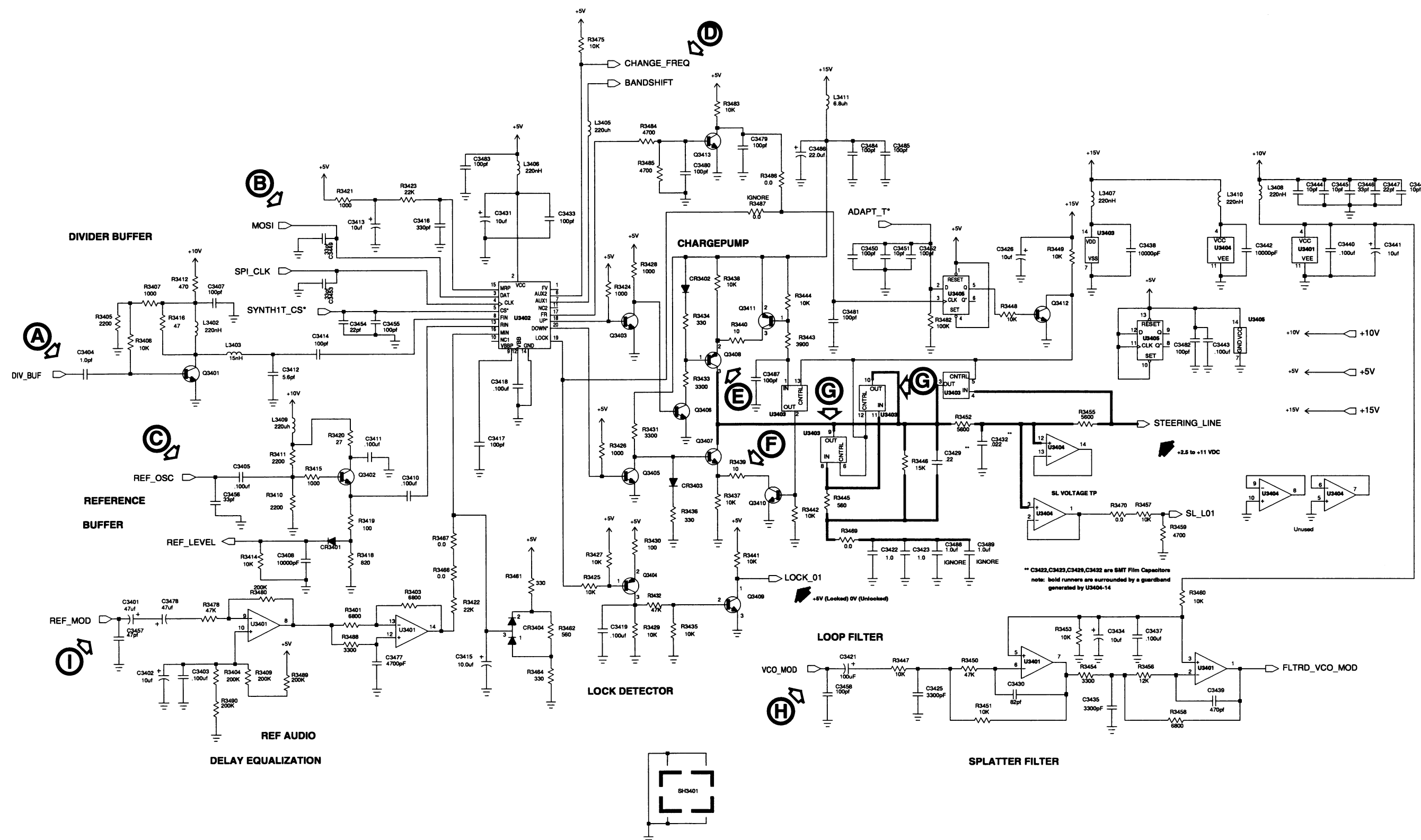
Signal Path	Description/Nominal Signal Levels
Ⓐ	A sample of the VCO output signal is fed to the VCO Divider Buffer Q3401 and output to the feedback input at U3402–pin 8.
Ⓑ	The MOSI serial data signal contains frequency selection data from the Host processor on the SCM. This data is clocked by the SPI CLOCK signal.
Ⓒ	2.1 MHz input from the SCM is buffered by Q3402 and fed to the Reference Input (RIN) of PLL synthesizer U3402–pin 13.
Ⓓ	PLL synthesizer U3402 compares the frequency of RIN (2.1 MHz from the SCM) and FIN (VCO feedback signal divided internally per programming data from station control via MOSI data line) and generates variable-width UP and DOWN pulses (pins 18 & 20). With the synthesizer locked, pins 18 & 20 generate extremely small pulse widths. With VCO <i>below</i> desired frequency, pin 18 pulse widths increase; with VCO <i>above</i> desired frequency, pin 20 pulse widths increase.
Ⓔ	+13.7 V with narrow 0.8 V DOWN pulses at 6.25 kHz or 5 kHz rate when locked.
Ⓕ	+1.3 V with narrow 0.8 V UP pulses at 6.25 kHz or 5 kHz rate when locked.
Ⓖ	The charge pump and loop filter convert UP/DOWN pulses from the PLL IC to a dc steering voltage which is fed to dual VCO circuitry to control the VCO output frequency. Adapt* is pulsed low for the first 10 msec (small frequency jump) or 20 msec (large frequency jump) when the frequency is changed. While adaptt* is low, analog switches U3403 are closed to bypass the loop filter for fast frequency change.
Ⓗ	VCO MOD consists of audio/data for modulating the VCO rf signal.
Ⓘ	Ref_Mod input from the Station Control Module. Used for low frequency (below 100 Hz) modulation.

U3402 Synthesizer IC

Pin #	Signal Name	Description/Nominal Voltage
1	FV	Test point; divided down VCO frequency; 6.25 kHz sawtooth waveform in locked condition
2	VCC	IC power; +5 V
3	DATA	Serial data input; 0–5 V logic level
4	CLK	Clock for serial data programming; 0–5 V logic level
5	$\overline{\text{CS}}$	Chip select; low when programming, high when not programming; 0–5 V logic level
6	AUX2	Change frequency; toggles between logic low and high with every frequency change
7	AUX1	Bandshift; high selects low frequency VCO; low selects high frequency VCO
8	FIN	Feedback rf input; transmit operating frequency riding on 1.4 V
9	VBBP	DC bias for prescaler input; 1.4 V
10	NC1	Not used
11	NC2	Not used
12	VBB	DC bias for reference divider input; 1.4 V
13	RIN	Reference divider input; 1 Vp-p, 2.1 MHz square wave riding on 1.4 V
14	GND	IC ground; 0 V
15	MRP	Connection to external ramp circuit for phase modulator; steeply sloped ramp, ramping between 0 and 5 V @ 6.25 kHz rate
16	MIN	Modulation input to phase modulator; +2.5 V
17	FR	Test point; divided down 2.1 MHz reference @ 6.25 kHz in a locked condition.
18	$\overline{\text{UP}}$	When locked, narrow (<1 microsecond) down pulses @ 6.25 kHz riding on 0.7 V
19	$\overline{\text{LOCK}}$	Loop locked; when locked, narrow (<1 microsecond) down pulses @ 6.25 kHz riding on 5 V
20	$\overline{\text{DOWN}}$	When locked, narrow (<1 microsecond) down pulses @ 6.25 kHz riding on 0.7 V

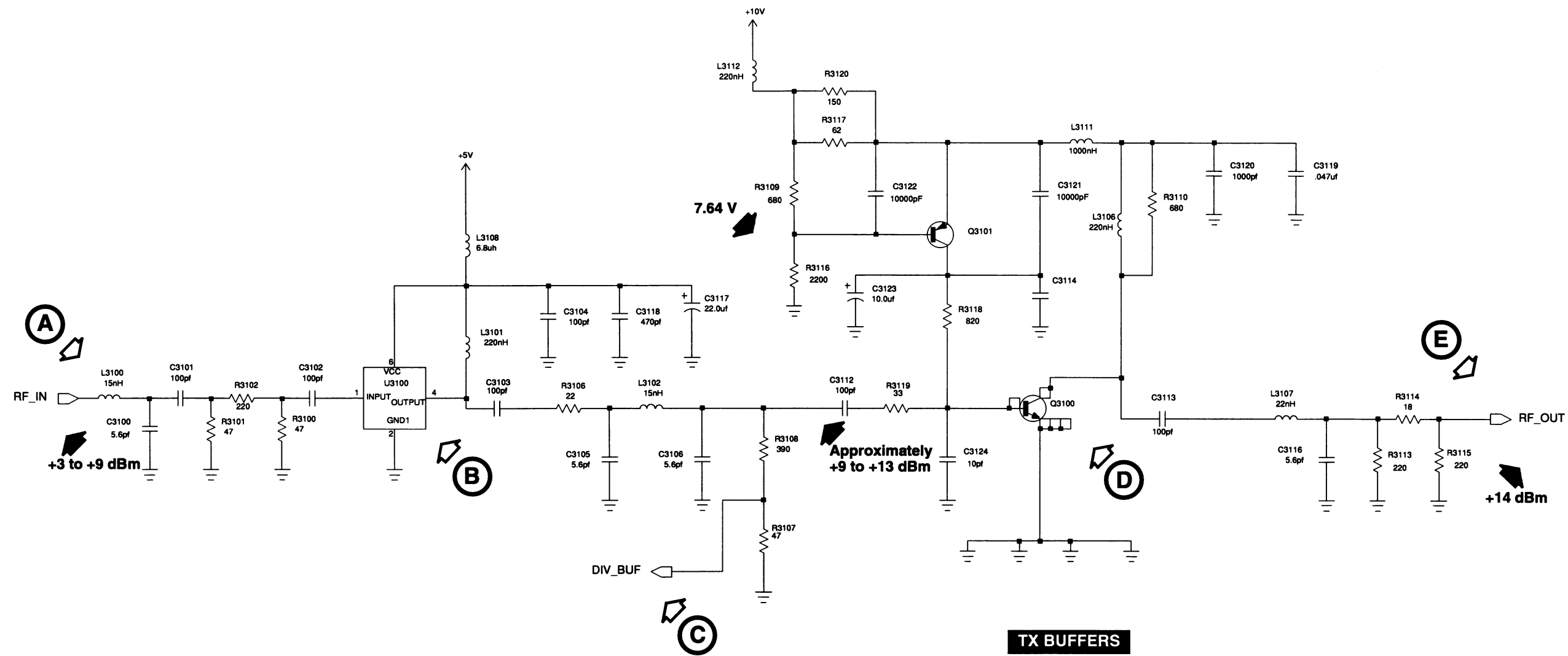
EXCITER MODULE

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TX SYNTHESIZER

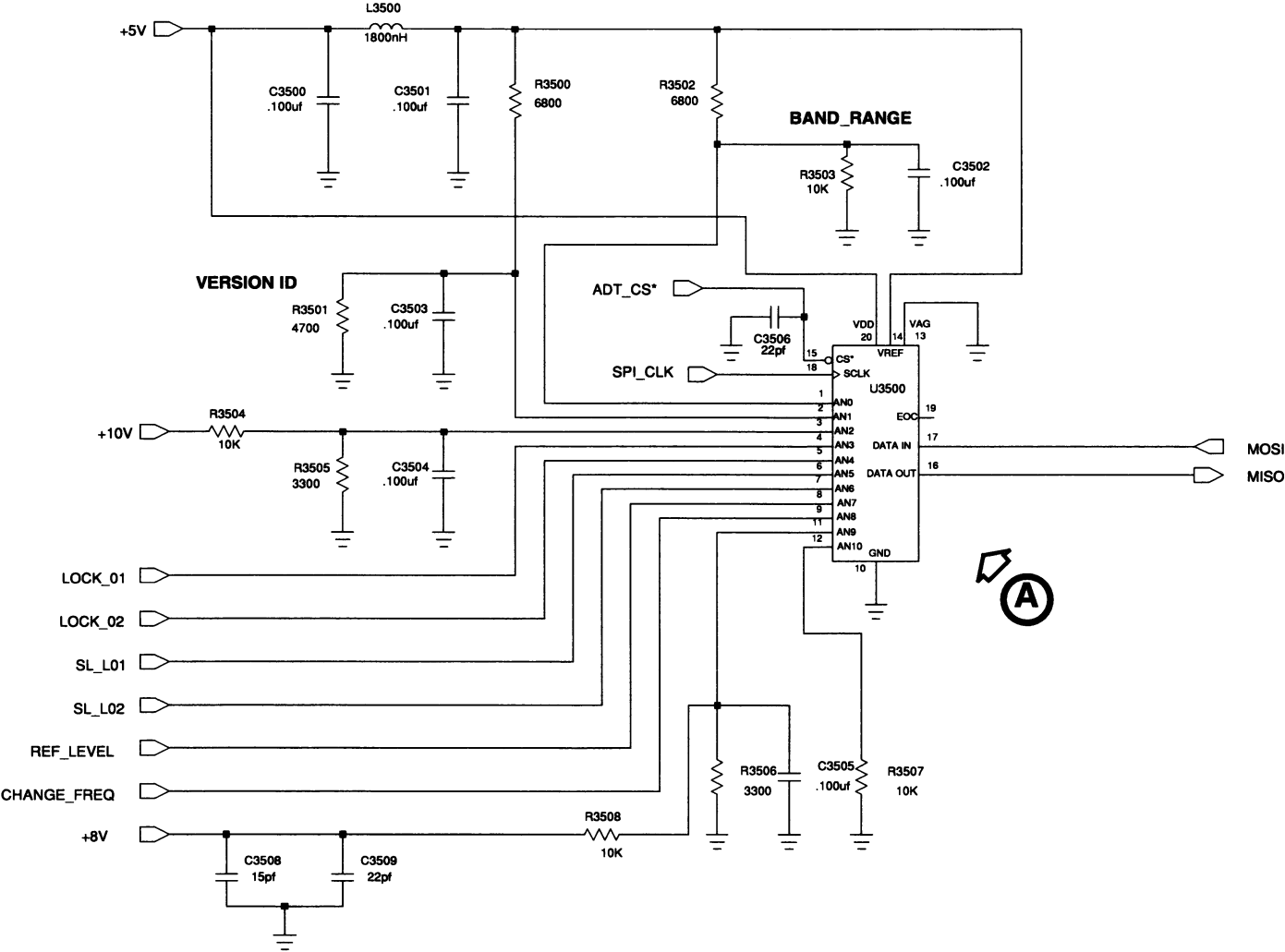
EXCITER MODULE
MODEL TTX4014A



TX Buffers Service Notes

Signal Path	Description/Nominal Signal Levels
Ⓐ	VCO signal input.
Ⓑ	MMIC RF amplifier chip. Typical gain is 34 dB.
Ⓒ	Feedback to the synthesizer chip.
Ⓓ	The final gain stage of the buffer amplifier consists of transistor Q3100 biased by Q3101. This stage provides approximately 10 dB of gain. Current control for Q3100 (IC appr. 30 mA) is provided by Q3101.
Ⓔ	RF output to Isolation Switch.

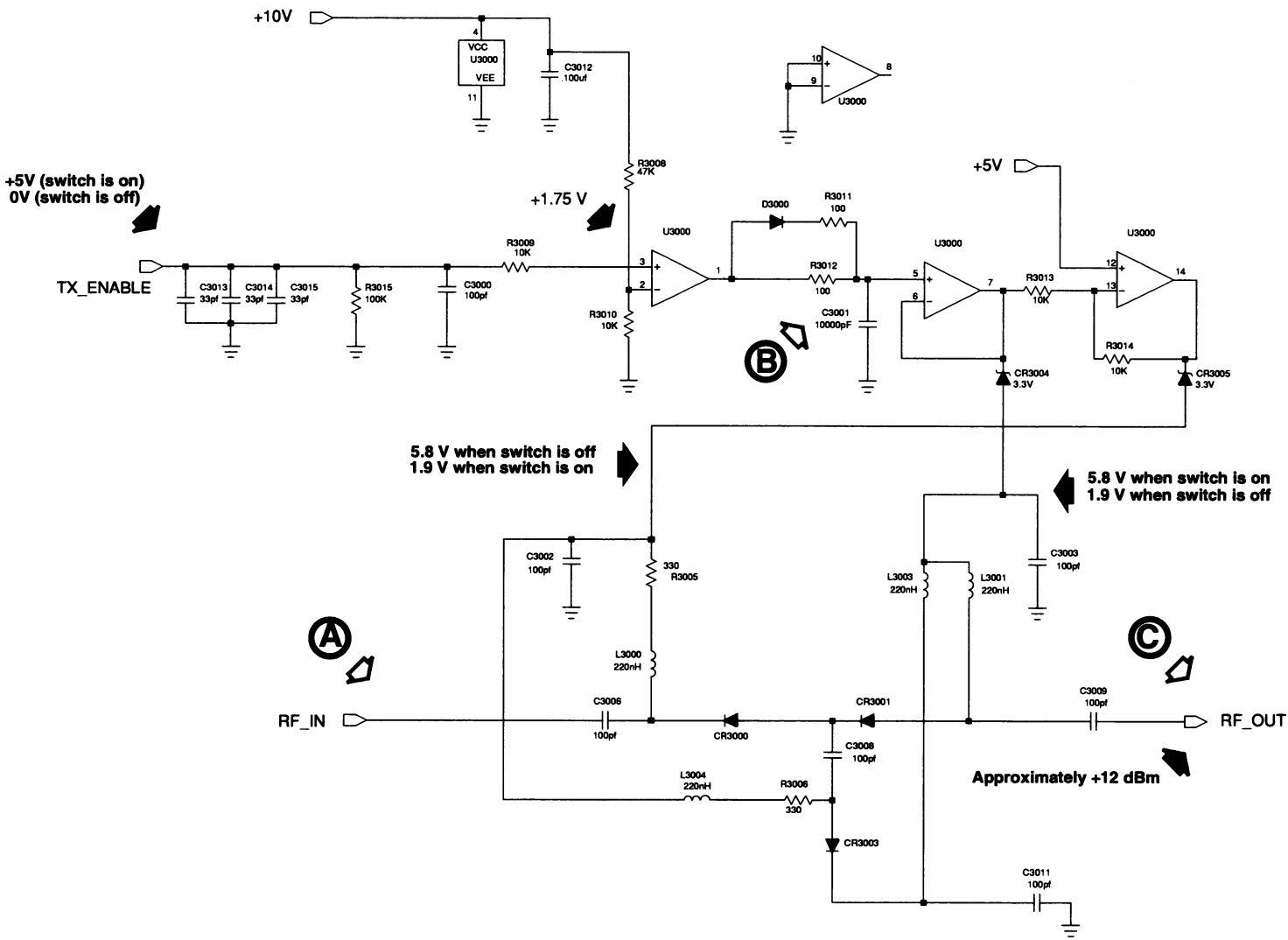
EXCITER MODULE
MODEL TTX4014A



METERING
CIRCUITRY

Metering Service Notes

Signal Path	Description/Nominal Signal Levels
Ⓐ	The 8 bit A/D converter communicates with the Station Control Module via the SPI bus lines MOSI and MISO. The inputs to the chip are levels that are used for diagnostic purposes and to identify the type of exciter board.



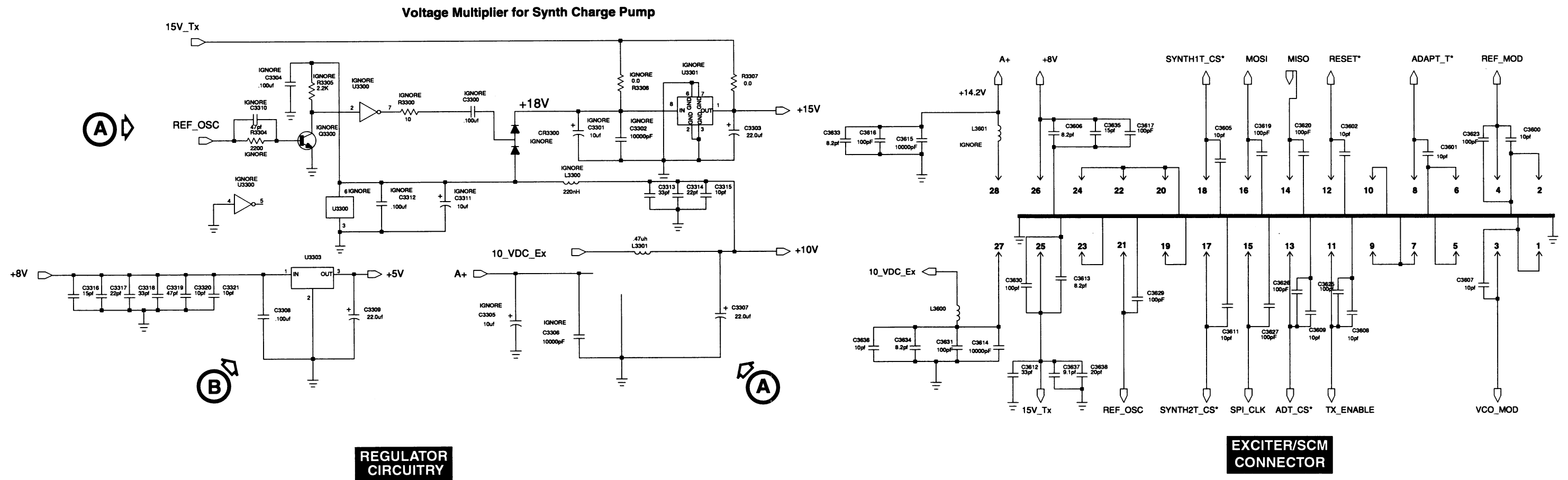
RF ISOLATION
CIRCUITRY

TX Switch Service Notes

Signal Path	Description/Nominal Signal Levels
Ⓐ	Input from Tx Buffer.
Ⓑ	RC time constant to control the speed of the switch.
Ⓒ	Output to the BNC connector (connected to the PA module).

EXCITER MODULE

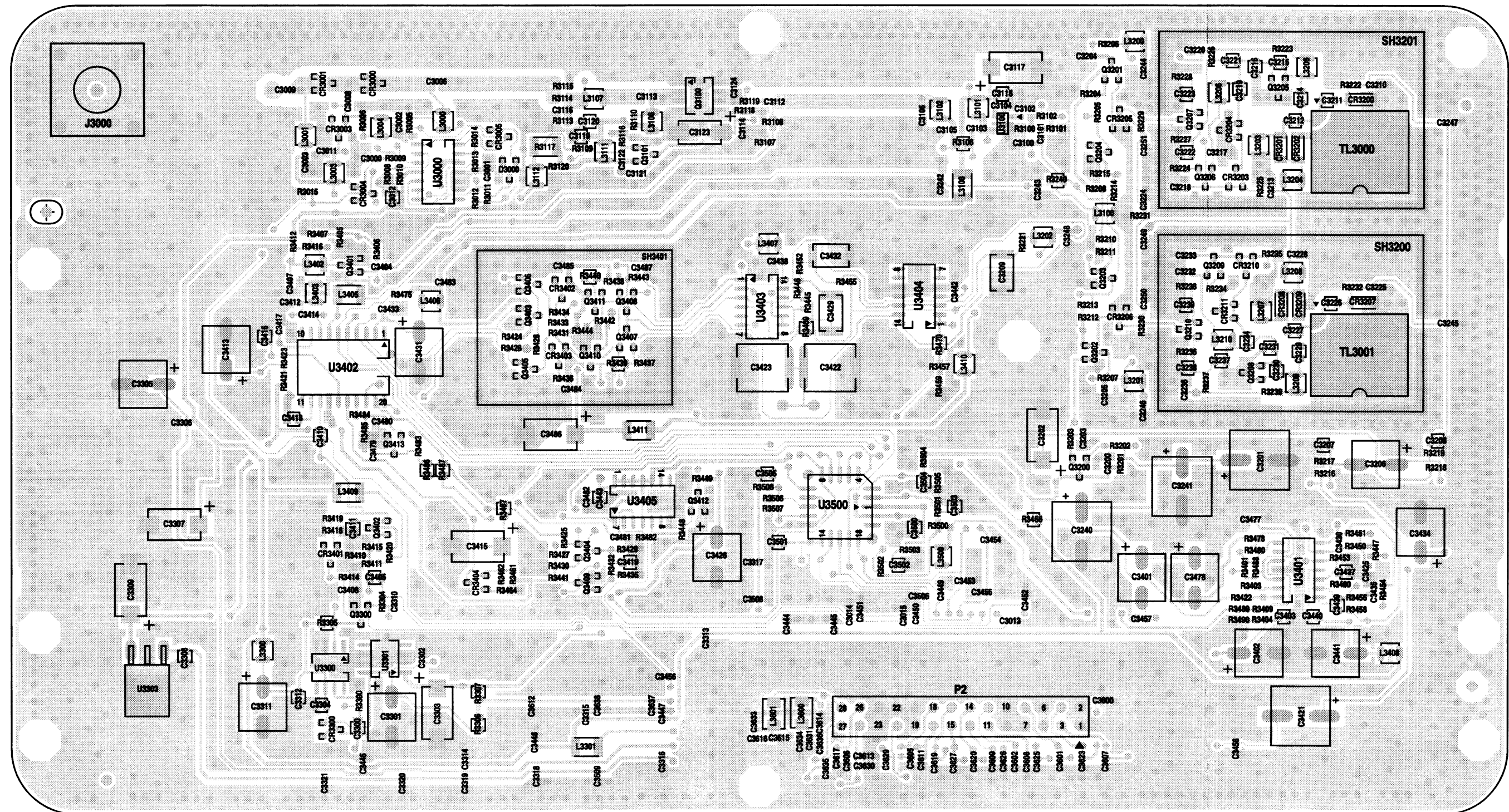
MODEL TTX4014A



Regulators Service Notes

Signal Path	Description/Nominal Signal Levels
(A)	The 15 V multiplier and regulator circuits have been moved to the Station Control Module. The +10V regulator has been moved to the Backplane.
(B)	The +5 V regulator on the exciter board supplies logic and bias levels to various circuits.

EXCITER MODULE
MODEL TTX4014A



UHF EXCITER BOARD DETAIL

EXCITER MODULE
MODEL TTX4014A

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Parts List

TTX4014A Exciter Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
CAPACITOR, FIXED: UF +/-10%; 100 V:		
UNLESS OTHERWISE STATED		
C3000	2113740F51	100 pF, +/-5%; 50V
C3001	2113741F49	0.01 uF, +/-5%; 50V
C3002,3003	2113740F51	100 pF, +/-5%; 50V
C3006	2113740F51	100 pF, +/-5%; 50V
C3008,3009	2113740F51	100 pF, +/-5%; 50V
C3011	2113740F51	100 pF, +/-5%; 50V
C3012	2113743A19	0.1 uF, +/-10%; 16V
C3013 thru 3015	2113740F39	33 pF, +/-5%; 50V
C3100	2113740F21	5.6 pF, +/-0.25 pF; 50V
C3101 thru 3104	2113740F51	100 pF, +/-5%; 50V
C3105,3106	2113740F21	5.6 pF, +/-0.25 pF; 50V
C3112 thru 3114	2113740F51	100 pF, +/-5%; 50V
C3116	2113740F21	5.6 pF, +/-0.25 pF; 50V
C3117	2311049A21	22 uF, +/-10%; 20 V
C3118	2113740A71	470 pF, +/-5%; 50 V
C3119	2113743A13	0.047 uF, +/-10%; 16V
C3120	2113740A79	1000 pF, +/-5%; 50 V
C3121,3122	2113741F49	0.01 uF, +/-5%; 50V
C3123	2311049A18	10 uF, +/-10%; 16V
C3124	2113740F27	10 pF, +/-5%; 50V
C3200	2113741F49	0.01 uF, +/-5%; 50V
C3201	2380090M36	CAP 100 UF 25V
C3202	2311049A23	47 uF, +/-10%; 10 V
C3203	2113741F49	0.01 uF, +/-5%; 50V
C3204,3205	2113740F51	100 pF, +/-5%; 50V
C3206	2380090M24	10 uF, +/-20%; 50 V
C3207,3208	2113741A51	0.018 uF, +/-5%; 50 V
C3209	0882422W29	CAP FILM SM 0.047UF 63V 5%
C3210	2113740F51	100 pF, +/-5%; 50V
C3211	2113740G03	1 pF, +/-0.1 pF; 50 V
C3212	2113901A16	CAP CHIP HI Q 3.0 PF +/-0.25PF
C3213	2113740F51	100 pF, +/-5%; 50V
C3214	2113901A28	CAP CHIP HI Q 9.1 PF +/-0.50PF
C3215	2113901A27	CAP CHIP HI Q 8.2 PF +/-0.50PF
C3216	2113901A23	CAP CHIP HI Q 5.6 PF +/-0.50PF
C3217,3218	2113740F51	100 pF, +/-5%; 50V
C3219	2113901A17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C3220	2113740F51	100 pF, +/-5%; 50V
C3221	2113901A09	CAP CHIP HI Q 1.8 PF +/-0.25PF
C3223	2113740A67	330 pF, +/-5%; 50 V
C3224,3225	2113740F51	100 pF, +/-5%; 50V
C3226	2113740G03	1 pF, +/-0.1 pF; 50 V
C3227	2113901A19	CAP CHIP HI Q 3.9 PF +/-0.25PF
C3228	2113740F51	100 pF, +/-5%; 50V
C3229,3230	2113901A27	CAP CHIP HI Q 8.2 PF +/-0.50PF
C3231	2113901A23	CAP CHIP HI Q 5.6 PF +/-0.50PF
C3232,3233	2113740F51	100 pF, +/-5%; 50V
C3234	2113901A17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C3236	2113740F51	100 pF, +/-5%; 50V
C3237	2113901A09	CAP CHIP HI Q 1.8 PF +/-0.25PF
C3239	2113740A67	330 pF, +/-5%; 50 V
C3240,3241	2380090M36	CAP 100 UF 25V
C3242 thru 3251	2113740F51	100 pF, +/-5%; 50V
C3303	2311049A21	22 uF, +/-10%; 20 V
C3307	2311049A21	22 uF, +/-10%; 20 V
C3308	2113743A19	0.1 uF, +/-10%; 16V
C3309	2311049A21	22 uF, +/-10%; 20 V
C3313	2113740F39	33 pF, +/-5%; 50V
C3314	2113740F35	22 pF, +/-5%; 50V
C3315	2113740F27	10 pF, +/-5%; 50V
C3316	2113740F31	15 pF, +/-5%; 50V
C3317	2113740F35	22 pF, +/-5%; 50V
C3318	2113740F39	33 pF, +/-5%; 50V
C3319	2113740F43	47 pF, +/-5%; 50V
C3320,3321	2113740F27	10 pF, +/-5%; 50V
C3401	2380090M07	47 uF, +/-20%; 16 V
C3402	2380090M24	10 uF, +/-20%; 50 V
C3403	2113743A19	0.1 uF, +/-10%; 16V
C3404	2113740F03	1 pF, +/-0.1 pF; 50V
C3405	2113743A19	0.1 uF, +/-10%; 16V
C3407	2113740F51	100 pF, +/-5%; 50V
C3408	2113741F49	0.01 uF, +/-5%; 50V
C3410,3411	2113743A19	0.1 uF, +/-10%; 16V
C3412	2113740F21	5.6 pF, +/-0.25 pF; 50V
C3413	2380090M24	10 uF, +/-20%; 50 V
C3414	2113740F51	100 pF, +/-5%; 50V
C3415	2311049A45	10 uF, +/-10%; 35 V
C3416	2113740A67	330 pF, +/-5%; 50 V
C3417	2113740F51	100 pF, +/-5%; 50V

TTX4014A Exciter Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C3418,3419	2113743A19	0.1 uF, +/-10%; 16V
C3421	2380090M36	CAP 100 UF 25V
C3422,3423	0882422W33	CAP FILM SM 1.0 UF 63V 5%
C3425	2113741F37	3300 pF, +/-5%; 50V
C3426	2380090M24	10 uF, +/-20%; 50 V
C3429	0882422W31	CAP FILM SM 0.22 UF 63V 5%
C3430	2113740F49	82 pF, +/-5%; 50V
C3431	2380090M24	10 uF, +/-20%; 50 V
C3432	0882422W28	CAP FILM SM 0.022UF 63V 5%
C3433	2113740F51	100 pF, +/-5%; 50V
C3434	2380090M24	10 uF, +/-20%; 50 V
C3435	2113741F37	3300 pF, +/-5%; 50V
C3437	2113743A19	0.1 uF, +/-10%; 16V
C3438	2113741F49	0.01 uF, +/-5%; 50V
C3439	2113740A71	470 pF, +/-5%; 50 V
C3440	2113743A19	0.1 uF, +/-10%; 16V
C3441	2380090M24	10 uF, +/-20%; 50 V
C3442	2113741F49	0.01 uF, +/-5%; 50V
C3443	2113743A19	0.1 uF, +/-10%; 16V
C3444,3445	2113740F27	10 pF, +/-5%; 50V
C3446	2113740F39	33 pF, +/-5%; 50V
C3447	2113740F35	22 pF, +/-5%; 50V
C3448	2113740F27	10 pF, +/-5%; 50V
C3449	2113740F39	33 pF, +/-5%; 50V
C3450	2113740F51	100 pF, +/-5%; 50V
C3451	2113740F27	10 pF, +/-5%; 50V
C3452	2113740F51	100 pF, +/-5%; 50V
C3453	2113740F39	33 pF, +/-5%; 50V
C3454	2113740F35	22 pF, +/-5%; 50V
C3455	2113740F51	100 pF, +/-5%; 50V
C3456	2113740F39	33 pF, +/-5%; 50V
C3457	2113740F43	47 pF, +/-5%; 50V
C3458	2113740F51	100 pF, +/-5%; 50V
C3477	2113741F41	4700 pF, +/-5%; 50V
C3478	2380090M07	47 uF, +/-20%; 16 V
C3479 thru 3485	2113740F51	100 pF, +/-5%; 50V
C3486	2311049A21	22 uF, +/-10%; 20 V
C3487	2113740F51	100 pF, +/-5%; 50V
C3500 thru 3505	2113743A19	0.1 uF, +/-10%; 16V
C3506	2113740F35	22 pF, +/-5%; 50V
C3508	2113740F31	15 pF, +/-5%; 50V
C3509	2113740F35	22 pF, +/-5%; 50V
C3600 thru 3602	2113740F27	10 pF, +/-5%; 50V
C3605	2113740F27	10 pF, +/-5%; 50V
C3606	2113740F25	8.2 pF, +/-0.25 pF; 50V
C3607 thru 3609	2113740F27	10 pF, +/-5%; 50V
C3611	2113740F27	10 pF, +/-5%; 50V
C3612	2113740F39	33 pF, +/-5%; 50V
C3613	2113740F25	8.2 pF, +/-0.25 pF; 50V
C3614,3615	2113741F49	0.01 uF, +/-5%; 50V
C3616,3617	2113741F01	100 pF, +/-5%; 50V
C3619,3620	2113741F01	100 pF, +/-5%; 50V
C3623	2113741F01	100 pF, +/-5%; 50V
C3625	2113740F51	100 pF, +/-5%; 50V
C3626,3627	2113741F01	100 pF, +/-5%; 50V
C3629	2113741F01	100 pF, +/-5%; 50V
C3630	2113740F51	100 pF, +/-5%; 50V
C3631	2113741F01	100 pF, +/-5%; 50V
C3633,3634	2113740F25	8.2 pF, +/-0.25 pF; 50V
C3635	2113740F31	15 pF, +/-5%; 50V
C3636	2113740F27	10 pF, +/-5%; 50V
C3637	2113740F26	9.1 pF, +/-0.25 pF; 50V
C3638	2113740F34	20 pF, +/-5%; 50V
		DIODE: (SEE NOTE)
CR3000,3001	4882030V01	DIODE HP PIN
CR3003	4882030V01	DIODE HP PIN
CR3004,3005	4813830A09	Zener, 3.3 V
CR3200 thru 3202	4805649Q11	DIODE VCTR ISV 212
CR3203,3204	4813825A05	Hot Carrier
CR3205,3206	4813825A06	Pin,35 V
CR3207 thru 3209	4805649Q11	DIODE VCTR ISV 212
CR3210,3211	4813825A05	Hot Carrier
CR3401	4813825A05	Hot Carrier
CR3402,3403	4813833C10	0.1A, 70 V
CR3404	4813833C05	dual 70 V
D3000	4813833C10	0.1A, 70 V
		CONNECTOR, RECEPTACLE:
J3000	0982492W01	BNC CONN PCB VERTICAL RECEPT

68P81094E07-A

Parts List (Sheet 13 of 15)

01/05/97

TTX4014A Exciter Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
COIL, INDUCTOR:		
L3000,3001	2462587X57	CHIP IND lopro 220 NH 5%
L3003,3004	2462587X57	CHIP IND lopro 220 NH 5%
L3100	2462587X43	IND CHIP LO-PRO 15.0 NH 5%
L3101	2462587X57	CHIP IND lopro 220 NH 5%
L3102	2462587X43	IND CHIP LO-PRO 15.0 NH 5%
L3106	2462587X57	CHIP IND lopro 220 NH 5%
L3107	2462587X45	IND CHIP LO-PRO 22.0 NH 5%
L3108	2411087A36	COIL CHIP 6.8 UH 10 A/P
L3111	2462587X68	IND CHIP LO-PRO 1,000 NH 5%
L3112	2462587X57	CHIP IND lopro 220 NH 5%
L3200 thru 3202	2462587X57	CHIP IND lopro 220 NH 5%
L3203	2462587X46	IND CHIP LO-PRO 27.0 NH 5%
L3204 thru 3206	2462587X57	CHIP IND lopro 220 NH 5%
L3207	2462587X47	IND CHIP LO-PRO 33.0 NH 5%
L3208 thru 3210	2462587X57	CHIP IND lopro 220 NH 5%
L3301	2411087A22	COIL; chip .47 uH
L3402	2462587X57	CHIP IND lopro 220 NH 5%
L3403	2462587X43	IND CHIP LO-PRO 15.0 NH 5%
L3405	2411087A54	220 uH, +/-10%
L3406 thru 3408	2462587X57	CHIP IND lopro 220 NH 5%
L3409	2411087A54	220 uH, +/-10%
L3410	2462587X57	CHIP IND lopro 220 NH 5%
L3411	2411087A36	COIL CHIP 6.8 UH 10 A/P
L3500	2462587N71	1800 nH, +/-5%
L3600	2484657R01	ferrite bead
CONNECTOR, PLUG:		
P2	2882982X01	HDR 2 X 14 VERT
TRANSISTOR: (SEE NOTE)		
Transistor; NPN		
Q3100	4813827A26	PNP
Q3101	4813824A17	PNP
Q3200	4813824A10	NPN
Q3201,3202	4813824A17	PNP
Q3203,3204	4813824A10	NPN
Q3205,3206	4880141L06	MOSFET
Q3207	4813827A03	NPN
Q3208,3209	4880141L06	MOSFET
Q3210	4813827A03	NPN
Q3401	4813827A03	NPN
Q3402,3403	4813824A10	NPN
Q3404	4813824A17	PNP
Q3405 thru 3407	4813824A10	NPN
Q3408	4813824A17	PNP
Q3409,3410	4813824A10	NPN
Q3411	4813824A17	PNP
Q3412,3413	4813824A10	NPN
RESISTOR, FIXED: +/-5%; 1/16 W:		
UNLESS OTHERWISE STATED		
R3005,3006	0662057A37	CHIP RES 330 OHMS
R3008	0662057A89	CHIP RES 47K OHMS
R3009,3010	0662057A73	CHIP RES 10K OHMS
R3011,3012	0662057A25	CHIP RES 100 OHMS
R3013,3014	0662057A73	CHIP RES 10K OHMS
R3015	0662057A97	CHIP RES 100K OHMS
R3100,3101	0662057A17	CHIP RES 47 OHMS
R3102	0662057A33	CHIP RES 220 OHMS
R3106	0611079A34	22 ohms, +/-; 1/10 W
R3107	0662057A17	CHIP RES 47 OHMS
R3108	0662057A39	CHIP RES 390 OHMS
R3109,3110	0662057A45	CHIP RES 680 OHMS
R3113	0662057A33	CHIP RES 220 OHMS 5%
R3114	0662057A07	CHIP RES 18 OHMS
R3115	0662057A33	CHIP RES 220 OHMS
R3116	0662057A57	CHIP RES 2200 OHMS
R3117	0611072A20	62 ohms, 1/4W
R3118	0662057A47	CHIP RES 820 OHMS
R3119	0662057A13	CHIP RES 33 OHMS
R3120	0662057A29	CHIP RES 150 OHMS
R3201	0662057A35	CHIP RES 270 OHMS
R3202,3203	0662057A01	CHIP RES 10 OHMS
R3204	0662057A41	CHIP RES 470 OHMS
R3205	0662057A59	CHIP RES 2700 OHMS
R3206,3207	0662057A09	CHIP RES 22 OHMS
R3208	0662057A69	CHIP RES 6800 OHMS
R3210	0662057A73	CHIP RES 10K OHMS
R3211	0662057A59	CHIP RES 2700 OHMS
R3212	0662057A41	CHIP RES 470 OHMS
R3213	0662057A59	CHIP RES 2700 OHMS

TTX4014A Exciter Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R3214	0662057A73	CHIP RES 10K OHMS
R3215	0662057A59	CHIP RES 2700 OHMS
R3216	0662057A73	CHIP RES 10K OHMS
R3217	0662057A41	CHIP RES 470 OHMS
R3218,3219	0662057A89	CHIP RES 47K OHMS
R3221	0662057A01	CHIP RES 10 OHMS
R3222	0662057A73	CHIP RES 10K OHMS
R3223	0662057A09	CHIP RES 22 OHMS
R3224	0662057A13	CHIP RES 33 OHMS
R3225	0662057A83	CHIP RES 27K OHMS
R3226	0662057A57	CHIP RES 2200 OHMS
R3227	0662057A49	CHIP RES 1000 OHMS
R3228	0662057A25	CHIP RES 100 OHMS
R3229,3230	0662057A89	CHIP RES 47K OHMS
R3231	0662057A18	CHIP RES 51 OHMS
R3232	0662057A73	CHIP RES 10K OHMS
R3234	0662057A13	CHIP RES 33 OHMS
R3235	0662057A83	CHIP RES 27K OHMS
R3236	0662057A49	CHIP RES 1000 OHMS
R3237	0662057A57	CHIP RES 2200 OHMS
R3238	0662057A25	CHIP RES 100 OHMS
R3239	0662057A09	CHIP RES 22 OHMS
R3240	0611079A01	O ohms, 1/10 W
R3307	0611079A01	O ohms, 1/10 W
R3401	0662057A69	CHIP RES 6800 OHMS
R3403	0662057A69	CHIP RES 6800 OHMS
R3404	0662057B05	CHIP RES 200K OHMS
R3405	0662057A57	CHIP RES 2200 OHMS
R3406	0662057A73	CHIP RES 10K OHMS
R3407	0662057A49	CHIP RES 1000 OHMS
R3409	0662057B05	CHIP RES 200K OHMS
R3410,3411	0662057A57	CHIP RES 2200 OHMS
R3412	0662057A41	CHIP RES 470 OHMS
R3414	0662057A73	CHIP RES 10K OHMS
R3415	0662057A49	CHIP RES 1000 OHMS
R3416	0662057A17	CHIP RES 47 OHMS
R3418	0662057A47	CHIP RES 820 OHMS
R3419	0662057A25	CHIP RES 100 OHMS
R3420	0662057A11	CHIP RES 27 OHMS
R3421	0662057A49	CHIP RES 1000 OHMS
R3422,3423	0662057A81	CHIP RES 22K OHMS
R3424	0662057A49	CHIP RES 1000 OHMS
R3425	0662057A73	CHIP RES 10K OHMS
R3426	0662057A49	CHIP RES 1000 OHMS
R3427	0662057A73	CHIP RES 10K OHMS
R3428	0662057A49	CHIP RES 1000 OHMS
R3429	0662057A73	CHIP RES 10K OHMS
R3430	0662057A25	CHIP RES 100 OHMS
R3431	0662057A61	CHIP RES 3300 OHMS
R3432	0662057A89	CHIP RES 47K OHMS
R3433	0662057A61	CHIP RES 3300 OHMS
R3434	0662057A37	CHIP RES 330 OHMS
R3435	0662057A73	CHIP RES 10K OHMS
R3436	0662057A37	CHIP RES 330 OHMS
R3437,3438	0662057A73	CHIP RES 10K OHMS
R3439,3440	0611079A26	10 ohms, 1/10 W
R3441,3442	0662057A73	CHIP RES 10K OHMS
R3443	0662057A63	CHIP RES 3900 OHMS
R3444	0662057A73	CHIP RES 10K OHMS
R3445	0662057A43	CHIP RES 560 OHMS
R3446	0662057A77	CHIP RES 15K OHMS
R3447 thru 3449	0662057A73	CHIP RES 10K OHMS
R3450	0662057A89	CHIP RES 47K OHMS
R3451	0662057A73	CHIP RES 10K OHMS
R3452	0662057A67	CHIP RES 5600 OHMS
R3453	0662057A73	CHIP RES 10K OHMS
R3454	0662057A61	CHIP RES 3300 OHMS
R3455	0662057A67	CHIP RES 5600 OHMS
R3456	0662057A75	CHIP RES 12K OHMS
R3457	0662057A73	CHIP RES 10K OHMS
R3458	0662057A69	CHIP RES 6800 OHMS
R3459	0662057A65	CHIP RES 4700 OHMS
R3460	0662057A73	CHIP RES 10K OHMS
R3461	0662057A37	CHIP RES 330 OHMS
R3462	0662057A43	CHIP RES 560 OHMS
R3464	0662057A37	CHIP RES 330 OHMS
R3466,3467	0611079A01	O ohms, 1/10 W
R3469,3470	0611079A01	O ohms, 1/10 W
R3475	0662057A73	CHIP RES 10K OHMS
R3478	0662057A89	CHIP RES 47K OHMS
R3480	0662057B05	CHIP RES 200K OHMS

68P81094E07-A

Parts List (Sheet 14 of 15)

01/05/97

TTX4014A Exciter Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R3482	0662057A97	CHIP RES 100K OHMS
R3483	0662057A73	CHIP RES 10K OHMS
R3484,3485	0662057A65	CHIP RES 4700 OHMS
R3486	0611079A01	O ohms, 1/10 W
R3488	0662057A61	CHIP RES 3300 OHMS
R3489,3490	0662057B05	CHIP RES 200K OHMS
R3500	0662057A69	CHIP RES 6800 OHMS
R3501	0662057A65	CHIP RES 4700 OHMS
R3502	0662057A69	CHIP RES 6800 OHMS
R3503,3504	0662057A73	CHIP RES 10K OHMS
R3505,3506	0662057A61	CHIP RES 3300 OHMS
R3507,3508	0662057A73	CHIP RES 10K OHMS
SHIELD:		
SH3200,3201	2682680X01	SHIELD VCO
HYBRID: (SEE NOTE)		
TL3000	5182667X01	RESONATOR, VCO, 436-470MHZ
TL3001	5182664X01	RESONATOR, VCO, 403-437MHZ
INTEGRATED CIRCUIT: (SEE NOTE)		
U3000	5113819A05	High Performance, Single Supply
U3100	5183014X01	MMIC 1.5GHZ WB AMP UPC2710
U3303	5113816A07	5-Volt Positive Regulator
U3401	5113819A05	High Performance, Single Supply
U3402	5184602T03	IC
U3403	5113806A21	Quad Analog Switch Multiplexer
U3404	5113819A08	Low Power
U3405	5113805A18	Dual D-Type Flip-Flop with Set/Reset
U3500	5113811A08	IC; 8-bit

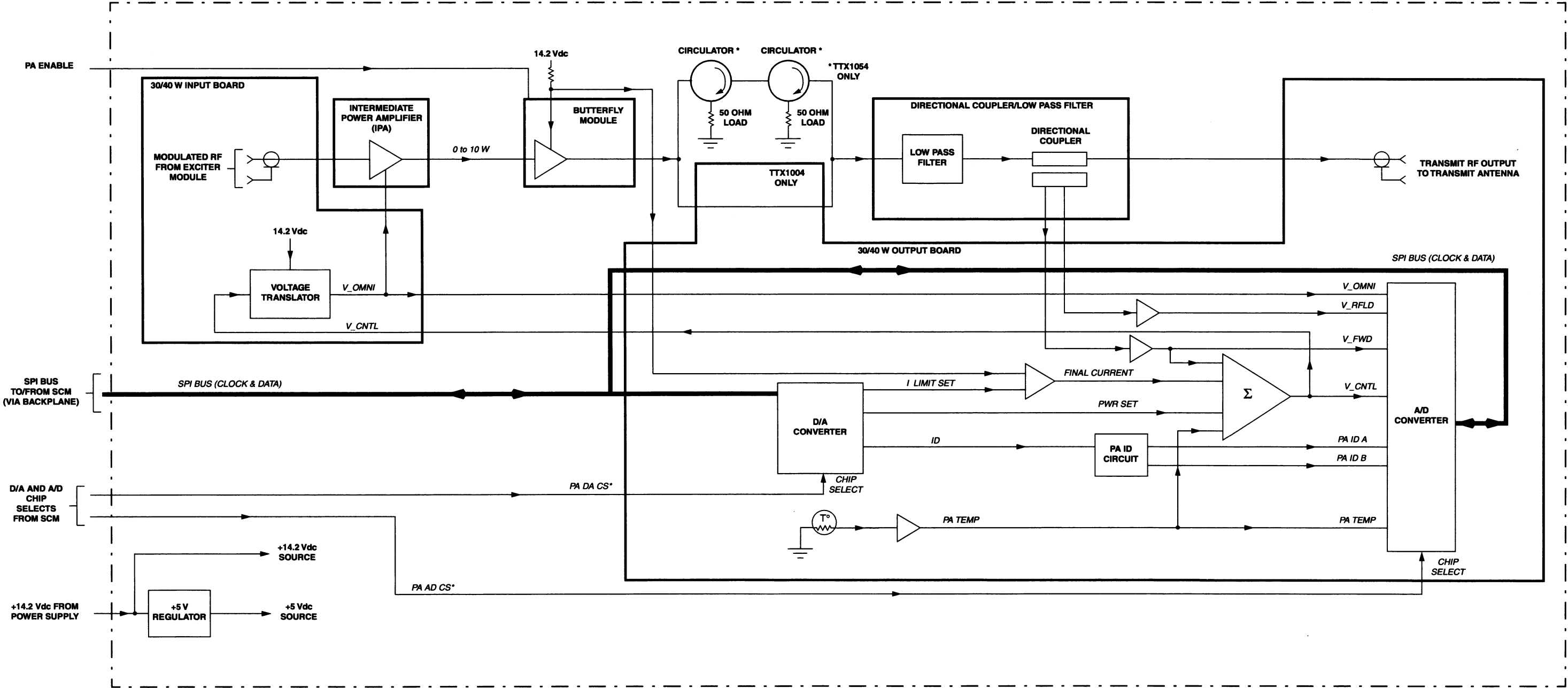
Note: For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

TTX4014A Exciter Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
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30/40W PA MODULE
MODEL TTX1054A/TTX1004A

	TTX1004 40 W	TTX1054 30 W
IPA	TLE9150	
Butterfly Module	TLE6341	
Coupler/LPF	TLE6091	
Input Board	CTX4010	
Output Board	CTX4004	CTX4024
Circulator		5884911T04

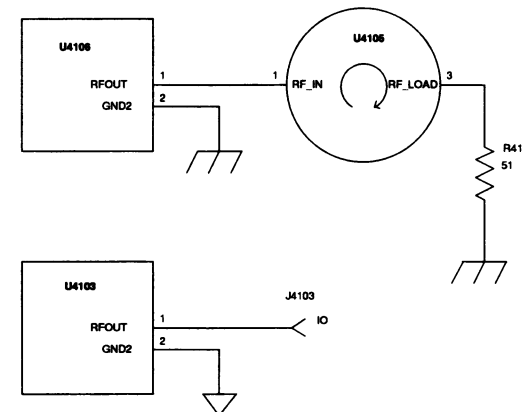


30/40W PA FUNCTIONAL BLOCK DIAGRAM

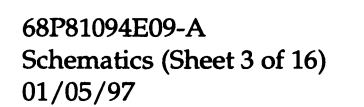
30/40W PA MODULE
MODEL TTX1054A/TTX1004A

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CTX4010A 30/40W INPUT BOARD



Signal Path	Description/Nominal Signal Levels
Ⓐ	Zero output: 0V 30/40W: typ 5V
Ⓑ	Zero output: 0V 30/40W: typ 5.5V
Ⓒ	Bias off: 0V Bias on: 5V



30/40W PA MODULE
MODEL TTX1054A/TTX1004A

KIT DEPENDENT COMPONENTS

REF. DES	TTE6392A	TTE6391A	TTD6462A	TTD6461A	CTX4024A
C4502	100	100	470	470	100
C4508	100	100	470	470	NOT USED
C4509	100	100	470	470	NOT USED
C4512	47000	47000	47000	47000	18000
C4517	100	100	NOT USED	NOT USED	100
C4518	NOT USED	NOT USED	470	470	NOT USED
C4519	100	100	470	470	100
C4520	100	100	470	470	100
C4522	10 uF	10 uF	10 uF	10 uF	NOT USED
C4533	100	100	470	470	100
C4534	100	100	470	470	100
C4535	100	100	470	470	100
C4536	100	100	470	470	100
C4538	10 uF	10 uF	10 uF	10 uF	NOT USED
C4539	100	100	470	470	100
C4540	100	100	470	470	100
C4541	100	100	470	470	100
C4543	100	100	470	470	100
C4544	100	100	470	100	100
C4546	100	100	470	470	100
C4547	100	100	470	470	NOT USED
C4548	100	100	470	470	100
C4549	100	100	470	470	100
C4553	100 uF	100 uF	100 uF	100 uF	NOT USED
C4555	100	100	470	470	100
C4556	100	100	470	470	100
C4557	100	100	470	470	100
C4558	100	100	470	470	100
C4559	100	100	56	470	100
C4569	100	100	470	100	100
C4579	100	100	470	470	100
C4580	100	100	470	470	100
C4581	NOT USED	NOT USED	NOT USED	NOT USED	0.1 uF
C4582	NOT USED	NOT USED	NOT USED	NOT USED	0.01 uF
C4583	NOT USED	NOT USED	NOT USED	NOT USED	1000
C4584	NOT USED	NOT USED	NOT USED	NOT USED	18000
C4587	NOT USED	NOT USED	NOT USED	NOT USED	2200
L4511	FERRITE BEAD	FERRITE BEAD	FERRITE BEAD	FERRITE BEAD	NOT USED
L4513	FERRITE BEAD	FERRITE BEAD	FERRITE BEAD	FERRITE BEAD	NOT USED
Q4502	NPN TRNSTR	NPN TRNSTR	NPN TRNSTR	NPN TRNSTR	NOT USED
Q4503	P-CH TRNSTR	P-CH TRNSTR	P-CH TRNSTR	P-CH TRNSTR	NOT USED
R4501	27	27	27	27	27

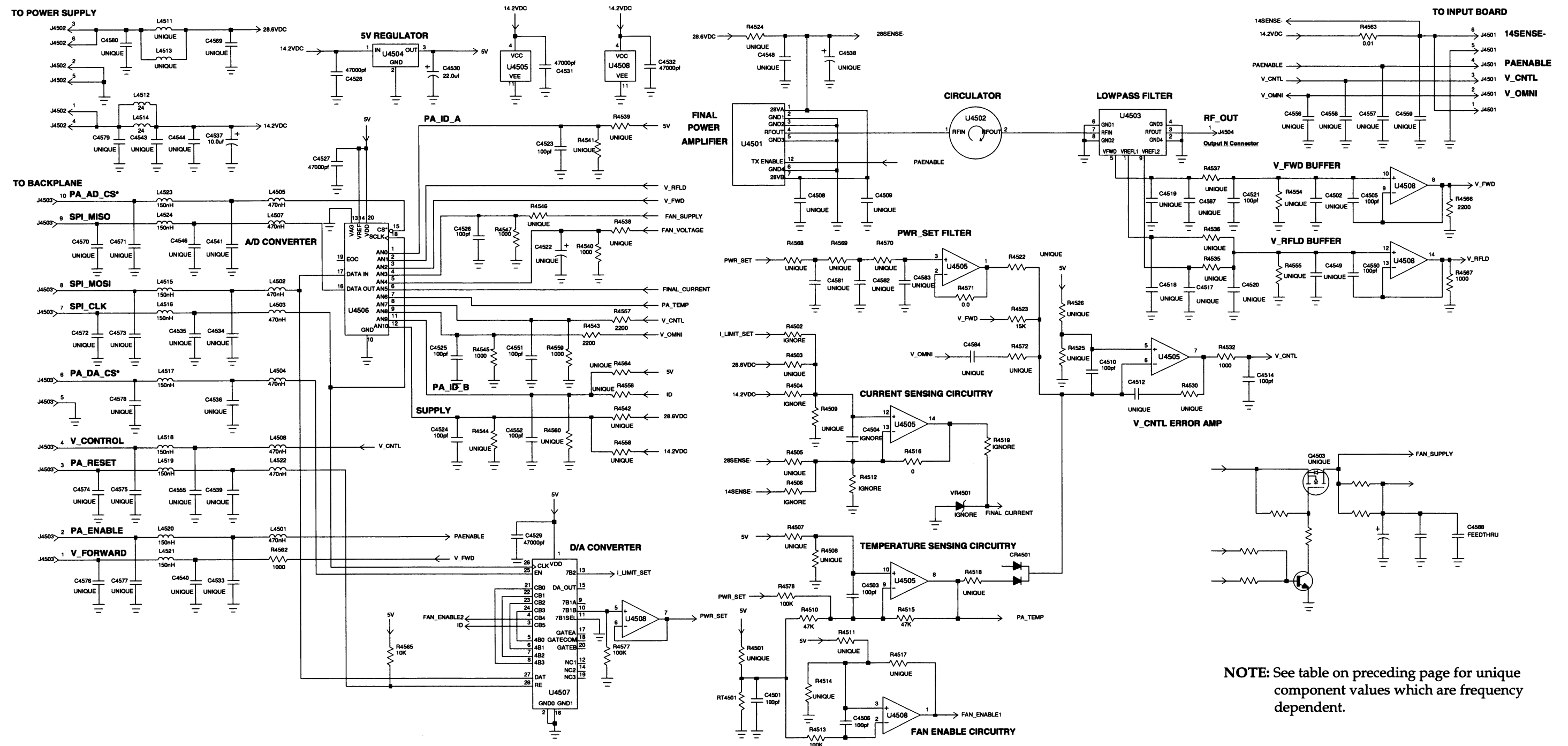
NOTE: ALL VALUES IN pF OR KOHM UNLESS OTHERWISE MARKED

KIT DEPENDENT COMPONENTS

REF. DES	TTE6392A	TTE6391A	TTD6462A	TTD6461A	CTX4024A
R4503	20	20	20	20	NOT USED
R4504	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
R4505	20.5	20.5	20.5	20.5	NOT USED
R4506	NOT USED	NOT USED	NOT USED	NOT USED	15
R4507	10	10	10	10	10
R4508	10	10	10	10	10
R4509	5.76	5.76	5.76	5.76	6.81
R4511	1.5	1.5	1.5	1.5	NOT USED
R4512	5.76	5.76	5.76	5.76	NOT USED
R4514	2.2	2.2	2.2	2.2	10
R4517	100	100	100	100	NOT USED
R4518	6.8	6.8	6.8	6.8	4.7
R4524	0.01 Ohms	0.01 Ohms	0.01 Ohms	0.01 Ohms	NOT USED
R4525	12	12	12	12	12
R4526	10	10	10	10	10
R4530	1	1	1	1	1
R4535	27	27	NOT USED	NOT USED	1
R4536	NOT USED	NOT USED	27	27	NOT USED
R4537	27	27	27	27	1
R4538	2.2	2.2	2.2	2.2	NOT USED
R4539	1.5	1.5	2.2	2.2	1.5
R4541	2.2	2.2	1	1	2.2
R4542	31.6	31.6	31.6	31.6	NOT USED
R4544	5.76	5.76	5.76	5.76	2.8
R4546	2.2	2.2	2.2	2.2	NOT USED
R4548	10	10	10	10	NOT USED
R4549	10	10	10	10	NOT USED
R4550	10	10	10	10	NOT USED
R4551	1	1	1	1	NOT USED
R4552	9.1 Ohms	9.1 Ohms	9.1 Ohms	9.1 Ohms	NOT USED
R4553	9.1 Ohms	9.1 Ohms	9.1 Ohms	9.1 Ohms	NOT USED
R4554	47	47	47	47	75
R4555	47	47	47	47	75
R4556	2.2	2.2	2.2	2.2	1
R4558	NOT USED	NOT USED	NOT USED	NOT USED	6.81
R4560	1.5	15	1.5	15	4.7
R4564	1.5	15	1.5	15	1.5
R4568	0.0	0.0	0.0	0.0	0.0
R4569	0.0	0.0	0.0	0.0	0.0
R4570	0.0	0.0	0.0	0.0	1.8
R4572	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED

NOTE: ALL VALUES IN pF OR KOHM UNLESS OTHERWISE MARKED

30/40W PA MODULE MODEL TTX1054A/TTX1004A



CTX4024A 30W PA OUTPUT BOARD

30/40W PA MODULE
MODEL TTX1054A/TTX1004A

KIT DEPENDENT COMPONENTS

REF. DES	CTX4004A	TTD6451A
C4502	100	100
C4512	47000	27000
C4517	100	NOT USED
C4518	NOT USED	100
C4519	100	100
C4520	100	100
C4533	100	100
C4534	100	100
C4535	100	100
C4536	100	100
C4539	100	100
C4540	100	100
C4541	100	100
C4543	100	470
C4544	100	470
C4546	100	100
C4548	100	470
C4555	100	100
C4556	100	470
C4557	100	470
C4558	100	470
C4559	100	470
C4560	100	NOT USED
C4561	100	NOT USED
C4562	NOT USED	NOT USED
C4563	NOT USED	NOT USED
C4564	NOT USED	56
C4565	NOT USED	100
C4566	NOT USED	20
C4567	NOT USED	NOT USED
C4568	NOT USED	3.3
C4569	100	470
C4570	8.2	8.2
C4571	8.2	8.2
C4572	8.2	8.2
C4573	8.2	8.2
C4574	8.2	8.2
C4575	8.2	8.2

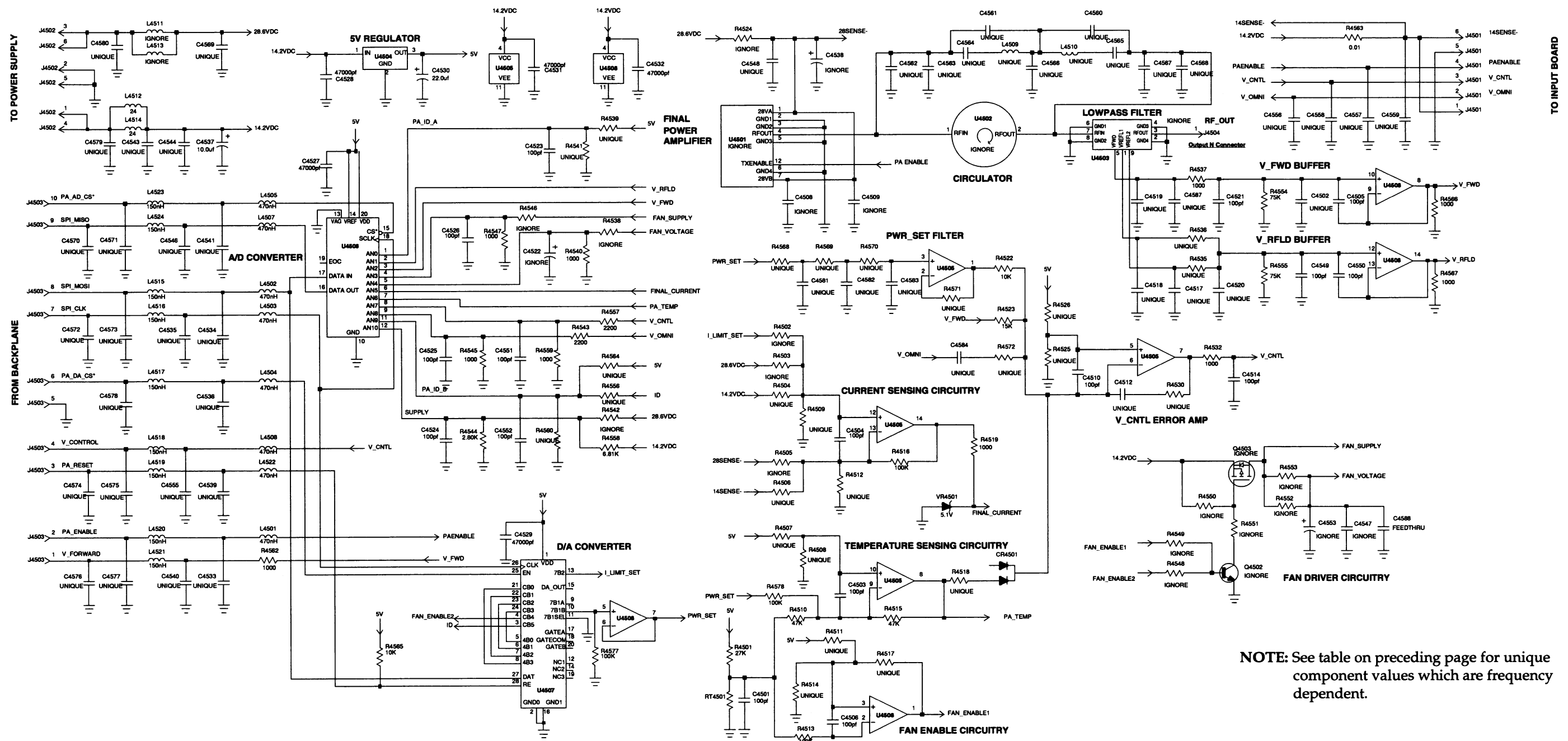
NOTE: ALL VALUES IN pF OR KOHM UNLESS OTHERWISE MARKED

KIT DEPENDENT COMPONENTS

REF. DES	CTX4004A	TTD6451A
C4576	8.2	8.2
C4577	8.2	8.2
C4578	8.2	8.2
C4579	100	470
C4580	100	470
C4581	0.1 uF	0.22 uF
C4582	0.01 uF	22000
C4583	1000	2200
C4584	18000	18000
C4587	47000	NOT USED
L4509	NOT USED	47 nH
L4510	NOT USED	61.6 nH
R4501	27	22
R4504	15	6.81
R4506	15	6.81
R4507	10	15
R4508	10	15
R4509	6.81	2.80
R4511	NOT USED	12
R4512	6.81	2.80
R4514	10	6.8
R4517	NOT USED	100
R4518	4.7	15
R4525	12	20
R4526	10	18
R4530	1	0.33
R4535	1	NOT USED
R4536	NOT USED	1
R4539	1.5	2.2
R4541	2.2	1
R4556	2.2	2.2
R4560	4.7	4.7
R4564	4.7	4.7
R4568	0.0	1.8
R4569	18	18
R4570	180	180
R4571	200	200
R4572	NOT USED	15

NOTE: ALL VALUES IN pF OR KOHM UNLESS OTHERWISE MARKED

30/40W PA MODULE MODEL TTX1054A/TTX1004A

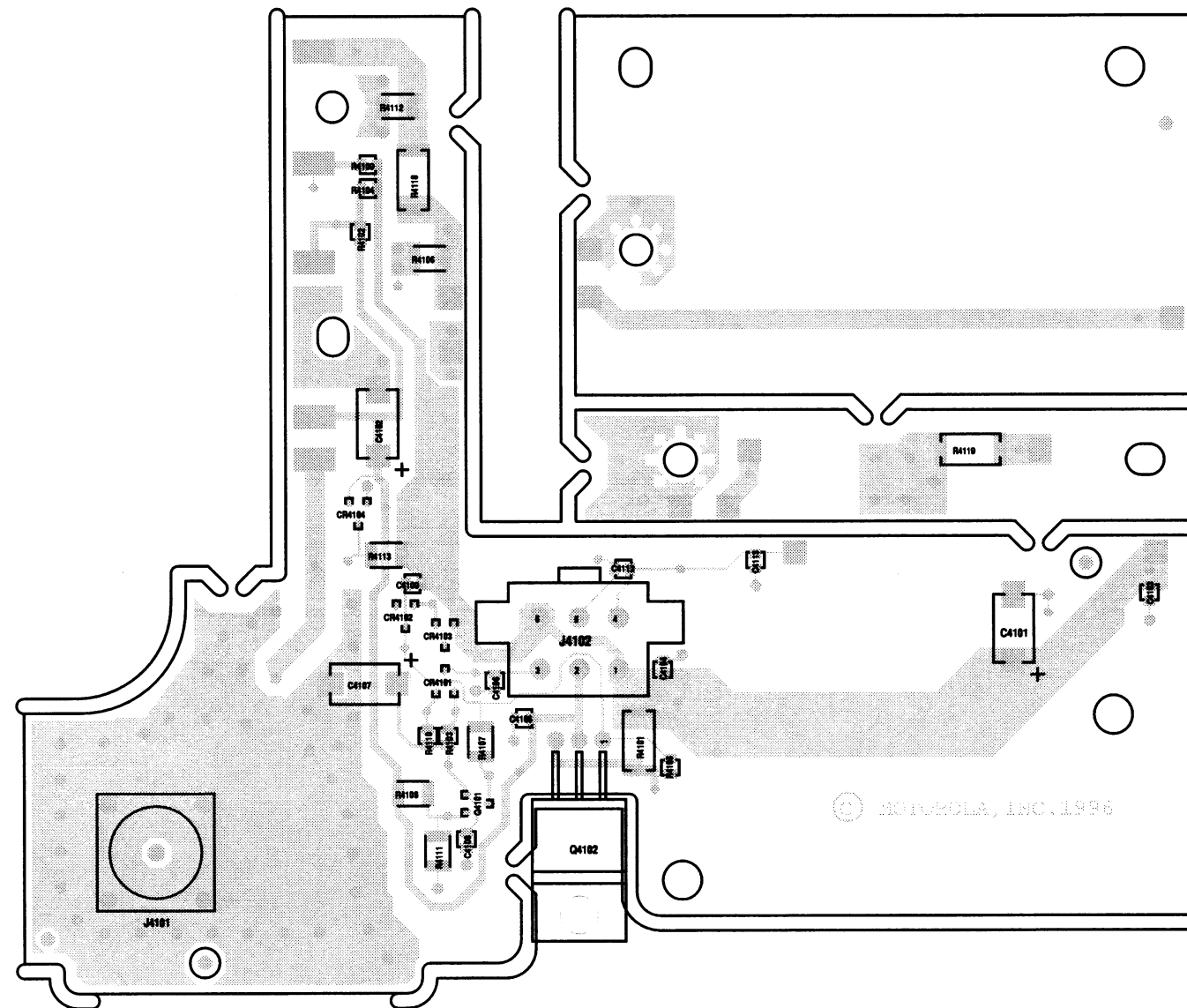


CTX4004A 40W PA OUTPUT BOARD

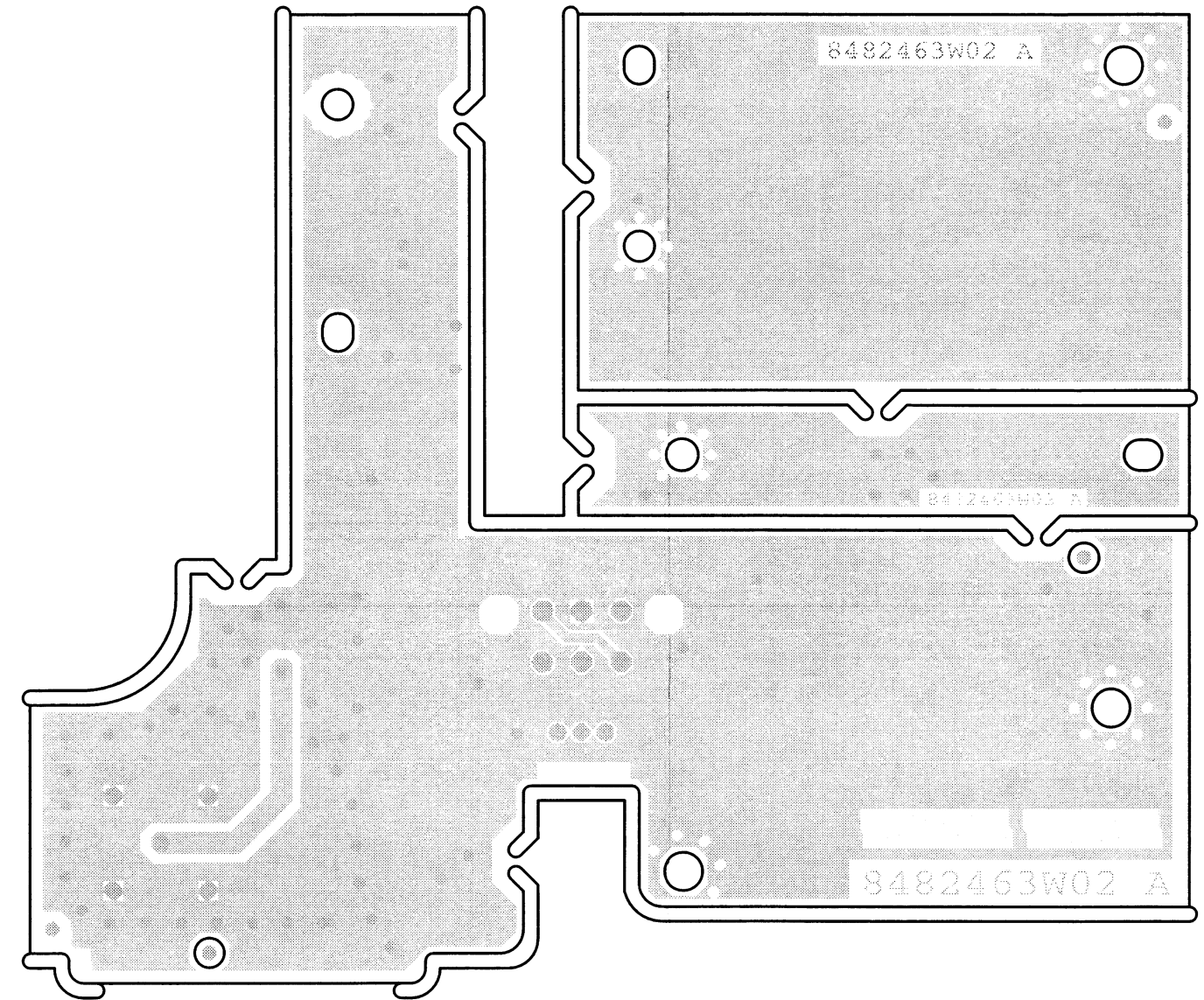
30/40W PA MODULE
MODEL TTX1054A/TTX1004A

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30/40W PA MODULE
MODEL TTX1054A/TTX1004A



HEAVY COMPONENT SIDE

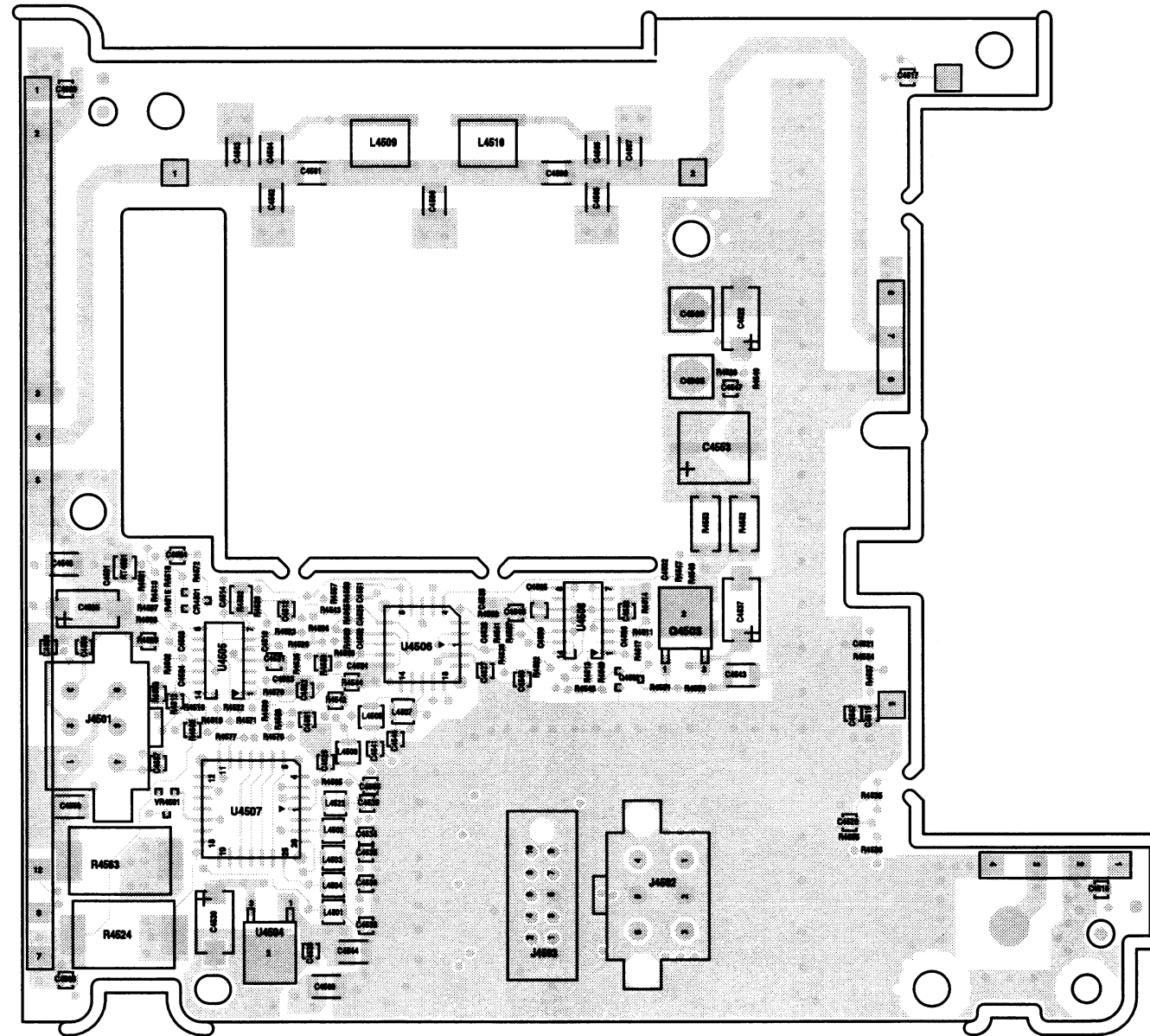


LIGHT COMPONENT SIDE

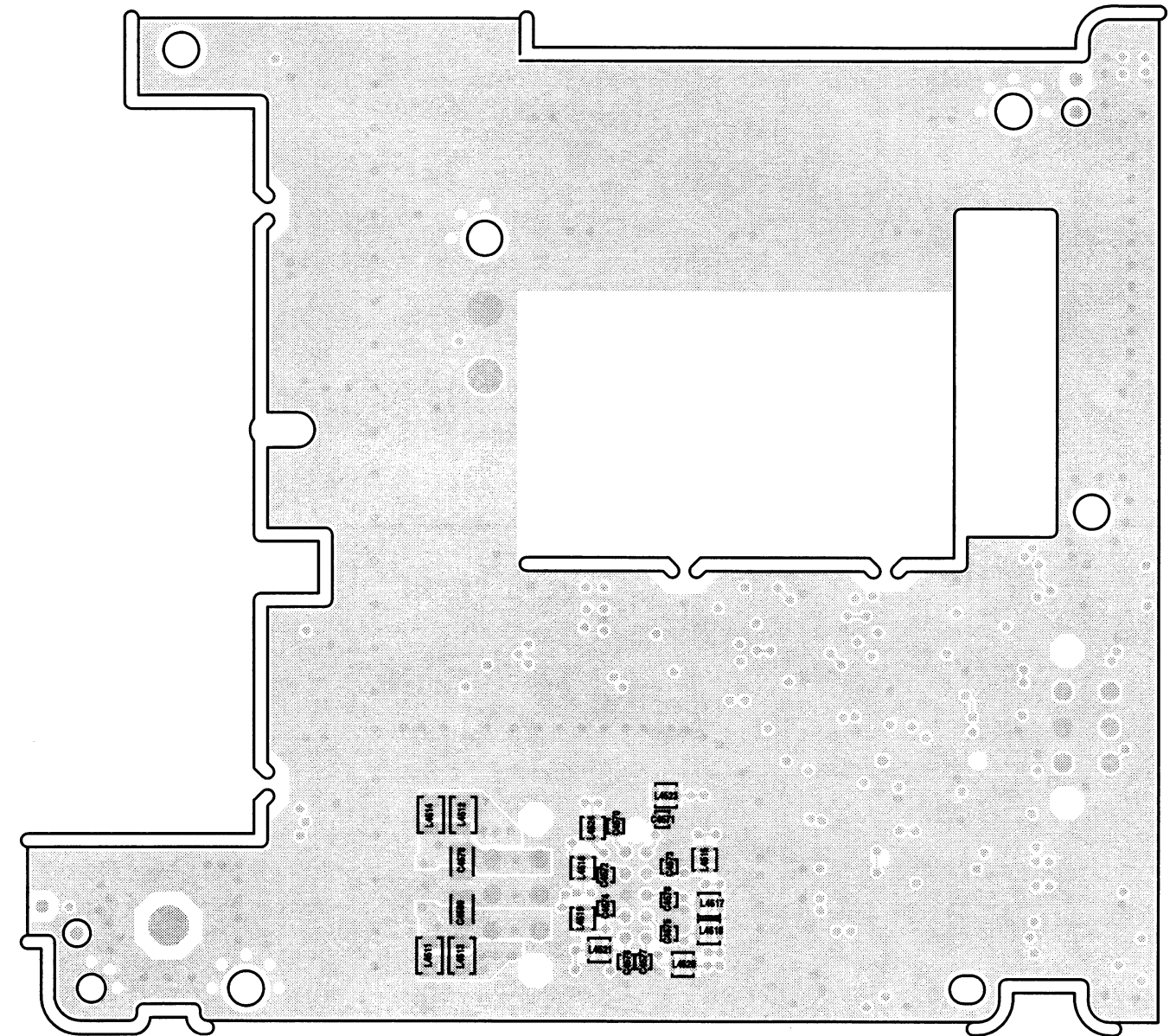
CTX4010A 30/40 W INPUT BOARD DETAIL

30/40W PA MODULE

MODEL TTX1054A/TTX1004A



HEAVY COMPONENT SIDE



LIGHT COMPONENT SIDE

CTX4004A 40 W INPUT BOARD DETAIL

30/40W PA MODULE
MODEL TTX1054A/TTX1004A

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Parts List

TTX1004A 40 W PA Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
CAPACITOR, FIXED: UF +/-10%; 100 V:		
UNLESS OTHERWISE STATED		
C4000	2113901C17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C4001	2113901C19	CAP CHIP HI Q 3.9 PF +/-0.25PF
C4003,4004	2113901C17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C4006	2113740A27	8.2 pF, +/-0.25 pF; 50 V
C4007	2113740A53	82 pF, +/-5%; 50 V
C4008	2113740A27	8.2 pF, +/-0.25 pF; 50 V
C4009	2113740A53	82 pF, +/-5%; 50 V
C4101,4102	2311049A45	10 uF, +/-10%; 35 V
C4103 to 4106	2113740A55	100 pF, +/-5%; 50 V
C4108	2113741A21	1000 pF, +/-5%; 50 V
C4109	2113740A55	100 pF, +/-5%; 50 V
C4112,4113	2113740A55	100 pF, +/-5%; 50 V
C4201	2113741B21	1000 pF, +/-5%; 50 V
C4202,4203	2113741A21	1000 pF, +/-5%; 50 V
C4204	2113741B21	1000 pF, +/-5%; 50 V
C4205	2113743A23	CAP CHIP .220 UF 10% X7R
C4206	2113743A19	0.1 uF, +/-10%; 16V
C4207 to 4209	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4210	2113901C33	CAP CHIP HI Q 14 PF +/- 5%
C4211,4212	2113901C43	CAP CHIP HI Q 30 PF +/- 5%
C4251,4252	2113901C43	CAP CHIP HI Q 30 PF +/- 5%
C4253,4254	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4255	2113741B69	0.1 uF, +/-5%; 50 V
C4256	2311049A17	6.8 uF, +/-10%; 35 V
C4257	2113901C33	CAP CHIP HI Q 14 PF +/- 5%
C4400	2113740A28	9.1 pF, +/-0.25 pF; 50V
C4401	2113741B69	0.1 uF, +/-5%; 50 V
C4402	2113740A36	20 pF, +/-5%; 50V
C4403	2113740A65	270 pF, +/-5%; 50V
C4404	2113740B49	100 pF, +/-5%; 50 V
C4405	2113740A21	5.6 pF, +/-0.25 pF; 50 V
C4406	2113740A40	30 pF, +/-5%; 50 V
C4407	2113740A65	270 pF, +/-5%; 50V
C4408	2113741B69	0.1 uF, +/-5%; 50 V
C4409	2113740A48	51 pF, +/-5%; 50V
C4410	2113740A29	10 pF, +/-5%; 50 V
C4411	2113740A55	100 pF, +/-5%; 50 V
C4412	2113740A38	24 pF, +/-5%; 50 V
C4413 to 4415	2113901C53	CAP CHIP HI Q 62 PF +/- 5%
C4416	2113901C40	CAP CHIP HI Q 25 PF +/- 5%
C4417	2113740B23	8.2 pF, +/-0.25 pF; 50V
C4418	2113741B69	0.1 uF, +/-5%; 50 V
C4419	2113740A55	100 pF, +/-5%; 50 V
C4501	2113740F51	100 pF, +/-5%; 50V
C4502	2113740A55	100 pF, +/-5%; 50 V
C4503	2113740F51	100 pF, +/-5%; 50V
C4505,4506	2113740F51	100 pF, +/-5%; 50V
C4510	2113740F51	100 pF, +/-5%; 50V
C4512	2113741A51	0.018 uF, +/-5%; 50V
C4514	2113740F51	100 pF, +/-5%; 50V
C4517	2113740A55	100 pF, +/-5%; 50 V
C4519,4520	2113740A55	100 pF, +/-5%; 50 V
C4521	2113740F51	100 pF, +/-5%; 50V
C4523 to 4526	2113740F51	100 pF, +/-5%; 50V
C4527 to 4529	2113741A61	0.047 uF, +/-5%; 50 V
C4530	2311049A21	22 uF, +/-10%; 20 V
C4531,4532	2113741A61	0.047 uF, +/-5%; 50 V
C4533 to 4536	2113740A55	100 pF, +/-5%; 50 V
C4537	2311049A45	10 uF, +/-10%; 35 V
C4539 to 4541	2113740A55	100 pF, +/-5%; 50 V
C4543,4544	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4546	2113740A55	100 pF, +/-5%; 50 V
C4548	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4549	2113740A55	100 pF, +/-5%; 50 V
C4550 to 4552	2113740F51	100 pF, +/-5%; 50V
C4555 to 4558	2113740A55	100 pF, +/-5%; 50 V
C4559 to 4561	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4569	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4570 to 4578	2113740A27	8.2 pF, +/-0.25 pF; 50 V
C4579,4580	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4581	2113743A19	0.1 uF, +/-10%; 16V
C4582	2113741A45	0.01 uF, +/-5%; 50 V
C4583	2113741A21	1000 pF, +/-5%; 50 V
C4584	2113741A51	0.018 uF, +/-5%; 50V
C4587	2113741F33	2200 pF, +/-5%; 50V
DIODE: (SEE NOTE)		
Diode; hot carrier		
CR4000,4001	4882290T04	dual 70 V
CR4101 to 4103	4813833C05	

TTX1004A 40 W PA Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
CR4400	4813833C05	dual 70 V
CR4501	4813833C02	Dual diode; common cathode
CONNECTOR, RECEPTACLE:		
J4101	0982492W01	BNC CONN PCB VERTICAL RECEPT
J4102	2884490T03	HDR 2X3 VERT PWR
J4501,4502	2884490T03	HDR 2X3 VERT PWR
CONNECTOR, PLUG:		
J4503	2885155U01	plug, 10-contact
COIL, INDUCTOR:		
L4000	2483383X01	COIL, AIRWOUND, 2T SM 16AWG
L4001,4002	2483383X02	COIL, AIRWOUND, 2T SM 16AWG
L4003	2483383X01	COIL, AIRWOUND, 2T SM 16AWG
L4004	2462587X43	IND CHIP LO-PRO 15.0 NH 5%
L4005	2411087A17	COIL; chip .18 uH
L4006	2462587X46	IND CHIP LO-PRO 27.0 NH 5%
L4007	2462587X43	IND CHIP LO-PRO 15.0 NH 5%
L4008	2411087A17	COIL; chip .18 uH
L4009	2462587X46	IND CHIP LO-PRO 27.0 NH 5%
L4201	2484657R01	ferrite bead
L4202	2460591A01	COIL AIR WOUND INDUC 4.22
L4251	2484657R01	ferrite bead
L4400	2411087A02	0.010 uH
L4402	2484657R01	ferrite bead
L4403,4404	2411087A02	0.010 uH
L4407	2484657R01	ferrite bead
L4408	2462587X41	IND CHIP LO-PRO 10.0 NH 5%
L4409	2411087A07	0.027 uH
L4410,4411	2484657R01	ferrite bead
L4412,4413	2460591A01	COIL AIR WOUND INDUC 4.22
L4501 to 4505	2462587X61	IND CHIP LO-PRO 470 NH 5%
L4507,4508	2462587X61	IND CHIP LO-PRO 470 NH 5%
L4512	2484657R01	ferrite bead
L4514	2484657R01	ferrite bead
L4515 to 4521	2462587X55	IND CHIP LO-PRO 150 NH 5%
L4522	2462587X61	IND CHIP LO-PRO 470 NH 5%
L4523,4524	2462587X55	IND CHIP LO-PRO 150 NH 5%
TRANSISTOR: (SEE NOTE)		
Q4101	4813824A10	NPN
Q4102	4813822D08	Transistor; 100 V
Q4201	4813824A11	NPN
Q4202	4813824A17	PNP
Q4203,4204	4813824A11	NPN
Q4205	4813824B01	TSTR NPN 40V GEN PURP 2222AT1
Q4206	4880225C30	TSTR RF 14W/50W UHF .5 CQ
Q4400	4813827A26	Transistor; NPN
Q4401	4882233P53	NPN
Q4402	4882233P54	Transistor; NPN
RESISTOR, FIXED: +/-5%; 1/16 W:		
UNLESS OTHERWISE STATED		
R4000	0611077A46	68 ohms, 1/8W
R4001	0611077A57	200 ohms, 1/8W
R4002	0611077A56	180 ohms, 1/8W
R4003	0611077A46	68 ohms, 1/8W
R4004	0611077A57	200 ohms, 1/8W
R4005	0611077A56	180 ohms, 1/8W
R4101	0683962T01	1 ohm, 1 W
R4102	0611079A01	0 ohms, 1/8W
R4103	0611079A60	270 ohms, 1/8W
R4105	0611079A98	10K, 1/8W
R4107	0611072A49	1K, 1/4 W
R4108	0611072A35	270 ohms, 1/4W
R4109	0611079A01	0 ohms, 1/8W
R4110	0611079A60	270 ohms, 1/8W
R4111	0611072A49	1K, 1/4 W
R4118	0683962T98	0.51 ohms, 1W
R4119	0683962T42	51 ohms, 1 W
R4201 to 4204	0611077A98	10K, 1/8W
R4205,4206	0611077A01	0 ohm, 0 W
R4208	0683962T42	51 ohms, 1 W
R4209	0611077A30	15 ohms, 1/8W
R4210	0611077A36	27 ohms, 1/8W
R4251	0611077A26	10 ohms, 1/8W
R4400	0611077A80	1.8K, 1/8W
R4401,4402	0611077A26	10 ohms, 1/8W
R4403	0611079A36	27 ohms, 1/8W
R4404	0611079A12	2.7 ohms, 1/8W

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TTX1004A 40 W PA Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R4406	0611079A36	27 ohms, 1/8W
R4407	0611079A60	270 ohms, 1/8W
R4409	0611072A41	470 ohms, 1/8W
R4410	0611077A57	200 ohms, 1/8W
R4411	0611079A55	RES FIXED CHIP 160 5 1/10W A/P
R4501	0662057A83	CHIP RES 27K OHMS
R4507,4508	0662057A73	CHIP RES 10K OHMS
R4509	0611079F81	RES CHIP 6.81K 1/10W 1% 0805
R4510	0662057A89	CHIP RES 47K OHMS
R4513	0662057A97	CHIP RES 100K OHMS
R4514	0662057A73	CHIP RES 10K OHMS
R4515	0662057A89	CHIP RES 47K OHMS
R4516	0662057B47	CHIP RES 0 OHMS +/- .050 OHMS
R4518	0662057A65	CHIP RES 4700 OHMS
R4522	0662057A73	CHIP RES 10K OHMS
R4523	0662057A77	CHIP RES 15K OHMS
R4525	0662057A75	CHIP RES 12K OHMS
R4526	0662057A73	CHIP RES 10K OHMS
R4530	0662057A49	CHIP RES 1000 OHMS
R4532	0611077A74	1K, 1/8W
R4535	0662057A49	CHIP RES 1000 OHMS
R4537	0662057A49	CHIP RES 1000 OHMS
R4539	0662057A53	CHIP RES 1500 OHMS
R4540	0662057A49	CHIP RES 1000 OHMS
R4541	0662057A57	CHIP RES 2200 OHMS
R4543	0662057A57	CHIP RES 2200 OHMS
R4544	0611079F44	RES CHIP 2.80K 1/10W 1% 0805
R4545	0662057A49	CHIP RES 1000 OHMS
R4547	0662057A49	CHIP RES 1000 OHMS
R4554,4555	0662057A94	CHIP RES 75K OHMS
R4556,4557	0662057A57	CHIP RES 2200 OHMS
R4558	0611079F81	RES CHIP 6.81K 1/10W 1% 0805
R4559	0662057A49	CHIP RES 1000 OHMS
R4560	0662057A65	CHIP RES 4700 OHMS
R4562	0662057A49	CHIP RES 1000 OHMS
R4563	0682089V01	SMT .01 2W
R4564	0662057A65	CHIP RES 4700 OHMS
R4565	0662057A73	CHIP RES 10K OHMS
R4566	0662057A57	CHIP RES 2200 OHMS
R4567	0662057A49	CHIP RES 1000 OHMS
R4568	0662057A55	CHIP RES 1800 OHMS
R4569	0662057A79	CHIP RES 18K OHMS
R4570	0662057B04	CHIP RES 180K OHMS
R4571	0662057B05	CHIP RES 200K OHMS
R4572	0662057A73	CHIP RES 10K OHMS
R4577,4578	0662057A97	CHIP RES 100K OHMS

THERMISTOR:

100 k, +/-10%; 240 mW

INTEGRATED CIRCUIT: (SEE NOTE)

U4504	5113816A07	5-Volt Positive Regulator
U4505	5113819A04	Quad Operational Amplifier
U4506	5113811A08	IC; 8-bit
U4507	5180057S02	IC CMOS CUST DA CONV 13" REEL
U4508	5113819A04	Quad Operational Amplifier

CABLE ASSEMBLY:

W4000 to 4007	4282981X01	STRAP PA BRAIDED
W4201 to 4203	4282981X01	STRAP PA BRAIDED
W4204,4205	4283431X01	GROUND CLIP
W4206	4284952P02	CLIP JU
W4207	4284952P03	CLIP, JU
W4251 to 4253	4282981X01	STRAP PA BRAIDED

NON-REFERENCED ITEMS

CTX4004A	PA,UHF,R4,40W,OUTPUT BD
CTX4010A	PA,UHF,40W INPUT BD
THN6785A	MODULE HOUSING PA LOW POWER
TLE6091A	LPF & FINAL COUPLER 1R
TLE9150A	UHF OMNI MODULE R1 & R2
TTE6341A	PA 50W MODULE
0310907A40	SCRMCH(M4X0.7X25) STRPANSTLCAD (8 used)
0312016A03	SCRTPG TT3X0.5X8 STARPAN (24 used)
0383498N14	SCREW, tapping: M4 x 0.7 x 18 (2 used)
0782106V01	BRACKET; low pass filter
0783544X01	BRACKET, OMNI
0900816159	CONNECTOR, receptacle: coaxial
1582626X02	COVER PA & PS CASTING
2682624X04	HEATSINK LOW POWER AMP

TTX1004A 40 W PA Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	3082728X05	CBL 6-WIRE
	3282170V01	GASKET RF (56 used)
	5482006W01	Label, PCB barcode
	5483323X01	LABEL, FREQ. REF.
	5484960T01	Label, barcode: 6.3 x 12.7mm, white (2 used)
	6482474V01	PLATE
	6483129N01	PLATE, transistor mtg

Note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part number.

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Parts List

TTX1054A 30W PA Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
CAPACITOR, FIXED: UF +/-10%; 100 V: UNLESS OTHERWISE STATED		
C4000	2113901C17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C4001	2113901C19	CAP CHIP HI Q 3.9 PF +/-0.25PF
C4003,4004	2113901C17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C4006	2113740A27	8.2 pF, +/-0.25 pF; 50 V
C4007	2113740A53	82 pF, +/-5%; 50 V
C4008	2113740A27	8.2 pF, +/-0.25 pF; 50 V
C4009	2113740A53	82 pF, +/-5%; 50 V
C4101,4102	2311049A45	10 uF, +/-10%; 35 V
C4103 to 4106	2113740A55	100 pF, +/-5%; 50 V
C4108	2113741A21	1000 pF, +/-5%; 50 V
C4109	2113740A55	100 pF, +/-5%; 50 V
C4112,4113	2113740A55	100 pF, +/-5%; 50 V
C4201	2113741B21	1000 pF, +/-5%; 50 V
C4202,4203	2113741A21	1000 pF, +/-5%; 50 V
C4204	2113741B21	1000 pF, +/-5%; 50 V
C4205	2113743A23	CAP CHIP .220 UF 10% X7R
C4206	2113743A19	0.1 uF, +/-10%; 16V
C4207 to 4209	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4210	2113901C33	CAP CHIP HI Q 14 PF +/- 5%
C4211,4212	2113901C43	CAP CHIP HI Q 30 PF +/- 5%
C4251,4252	2113901C43	CAP CHIP HI Q 30 PF +/- 5%
C4253,4254	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4255	2113741B69	0.1 uF, +/-5%; 50 V
C4256	2311049A17	6.8 uF, +/-10%; 35 V
C4257	2113901C33	CAP CHIP HI Q 14 PF +/- 5%
C4400	2113740A28	9.1 pF, +/-0.25 pF; 50V
C4401	2113741B69	0.1 uF, +/-5%; 50 V
C4402	2113740A36	20 pF, +/-5%; 50V
C4403	2113740A65	270 pF, +/-5%; 50V
C4404	2113740B49	100 pF, +/-5%; 50 V
C4405	2113740A21	5.6 pF, +/-0.25 pF; 50 V
C4406	2113740A40	30 pF, +/-5%; 50 V
C4407	2113740A65	270 pF, +/-5%; 50V
C4408	2113741B69	0.1 uF, +/-5%; 50 V
C4409	2113740A48	51 pF, +/-5%; 50V
C4410	2113740A29	10 pF, +/-5%; 50 V
C4411	2113740A55	100 pF, +/-5%; 50 V
C4412	2113740A38	24 pF, +/-5%; 50 V
C4413 to 4415	2113901C53	CAP CHIP HI Q 62 PF +/- 5%
C4416	2113901C40	CAP CHIP HI Q 25 PF +/- 5%
C4417	2113740B23	8.2 pF, +/-0.25 pF; 50V
C4418	2113741B69	0.1 uF, +/-5%; 50 V
C4419	2113740A55	100 pF, +/-5%; 50 V
C4501	2113740F51	100 pF, +/-5%; 50V
C4502	2113740A55	100 pF, +/-5%; 50 V
C4503	2113740F51	100 pF, +/-5%; 50V
C4505,4506	2113740F51	100 pF, +/-5%; 50V
C4510	2113740F51	100 pF, +/-5%; 50V
C4512	2113741A51	0.018 uF, +/-5%; 50V
C4514	2113740F51	100 pF, +/-5%; 50V
C4517	2113740A55	100 pF, +/-5%; 50 V
C4519,4520	2113740A55	100 pF, +/-5%; 50 V
C4521	2113740F51	100 pF, +/-5%; 50V
C4523 to 4526	2113740F51	100 pF, +/-5%; 50V
C4527 to 4529	2113741A61	0.047 uF, +/-5%; 50 V
C4530	2311049A21	22 uF, +/-10%; 20 V
C4531,4532	2113741A61	0.047 uF, +/-5%; 50 V
C4533 to 4536	2113740A55	100 pF, +/-5%; 50 V
C4537	2311049A45	10 uF, +/-10%; 35 V
C4539 to 4541	2113740A55	100 pF, +/-5%; 50 V
C4543,4544	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4546	2113740A55	100 pF, +/-5%; 50 V
C4548	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4549	2113740A55	100 pF, +/-5%; 50 V
C4550 to 4552	2113740F51	100 pF, +/-5%; 50V
C4555 to 4558	2113740A55	100 pF, +/-5%; 50 V
C4559	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4569	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4570 to 4578	2113740A27	8.2 pF, +/-0.25 pF; 50 V
C4579,4580	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4581	2113743A19	0.1 uF, +/-10%; 16V
C4582	2113741A45	0.01 uF, +/-5%; 50 V
C4583	2113741A21	1000 pF, +/-5%; 50 V
C4584	2113741A51	0.018 uF, +/-5%; 50V
C4587	2113741F33	2200 pF, +/-5%; 50V
DIODE: (SEE NOTE) Diode; hot carrier dual 70 V		
CR4000,4001	4882290T04	
CR4101 to 4103	4813833C05	

TTX1054A 30W PA Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
CR4400	4813833C05	dual 70 V
CR4501	4813833C02	Dual diode; common cathode
CONNECTOR, RECEPTACLE: BNC CONN PCB VERTICAL RECEPT HDR 2X3 VERT PWR HDR 2X3 VERT PWR		
J4101	0982492W01	
J4102	2884490T03	
J4501,4502	2884490T03	
CONNECTOR, PLUG: plug, 10-contact		
J4503	2885155U01	
COIL, INDUCTOR: COIL, AIRWOUND, 2T SM 16AWG COIL, AIRWOUND, 2T SM 16AWG COIL, AIRWOUND, 2T SM 16AWG IND CHIP LO-PRO 15.0 NH 5% COIL; chip .18 uH IND CHIP LO-PRO 27.0 NH 5% IND CHIP LO-PRO 15.0 NH 5% COIL; chip .18 uH IND CHIP LO-PRO 27.0 NH 5% ferrite bead COIL AIR WOUND INDUC 4.22 ferrite bead 0.010 uH ferrite bead 0.010 uH ferrite bead IND CHIP LO-PRO 10.0 NH 5% 0.027 uH ferrite bead COIL AIR WOUND INDUC 4.22 IND CHIP LO-PRO 470 NH 5% IND CHIP LO-PRO 470 NH 5% ferrite bead ferrite bead IND CHIP LO-PRO 150 NH 5% IND CHIP LO-PRO 470 NH 5% IND CHIP LO-PRO 150 NH 5%		
L4000	2483383X01	
L4001,4002	2483383X02	
L4003	2483383X01	
L4004	2462587X43	
L4005	2411087A17	
L4006	2462587X46	
L4007	2462587X43	
L4008	2411087A17	
L4009	2462587X46	
L4201	2484657R01	
L4202	2460591A01	
L4251	2484657R01	
L4400	2411087A02	
L4402	2484657R01	
L4403,4404	2411087A02	
L4407	2484657R01	
L4408	2462587X41	
L4409	2411087A07	
L4410,4411	2484657R01	
L4412,4413	2460591A01	
L4501 to 4505	2462587X61	
L4507,4508	2462587X61	
L4512	2484657R01	
L4514	2484657R01	
L4515 to 4521	2462587X55	
L4522	2462587X61	
L4523,4524	2462587X55	
TRANSISTOR: (SEE NOTE) NPN Transistor; 100 V NPN PNP NPN TSTR NPN 40V GEN PURP 2222AT1 TSTR RF 14W/50W UHF .5 CQ Transistor; NPN NPN Transistor; NPN		
Q4101	4813824A10	
Q4102	4813822D08	
Q4201	4813824A11	
Q4202	4813824A17	
Q4203,4204	4813824A11	
Q4205	4813824B01	
Q4206	4880225C30	
Q4400	4813827A26	
Q4401	4882233P53	
Q4402	4882233P54	
RESISTOR, FIXED: +/-5%; 1/16 W: UNLESS OTHERWISE STATED 68 ohms, 1/8W 200 ohms, 1/8 W 180 ohms, 1/8W 68 ohms, 1/8W 200 ohms, 1/8 W 180 ohms, 1/8W 1 ohm, 1 W O ohms, 1/10 W 270 ohms, 1/10 W 10K, 1/10 W 1K, 1/4 W 270 ohms, 1/4W O ohms, 1/10 W 270 ohms, 1/10 W 1K, 1/4 W 0.51 ohms, 1W 51 ohms, 1 W 10K, 1/8 W 0 ohm, 0 W 51 ohms, 1 W 15 ohms, 1/8 W 27 ohms, 1/8 W 10 ohms, 1/8 W 1.8K, 1/8 W 10 ohms, 1/8 W 27 ohms, 1/10 W 2.7 ohms, 1/10 W		
R4000	0611077A46	
R4001	0611077A57	
R4002	0611077A56	
R4003	0611077A46	
R4004	0611077A57	
R4005	0611077A56	
R4101	0683962T01	
R4102	0611079A01	
R4103	0611079A60	
R4105	0611079A98	
R4107	0611072A49	
R4108	0611072A35	
R4109	0611079A01	
R4110	0611079A60	
R4111	0611072A49	
R4118	0683962T98	
R4119	0683962T42	
R4201 to 4204	0611077A98	
R4205,4206	0611077A01	
R4208	0683962T42	
R4209	0611077A30	
R4210	0611077A36	
R4251	0611077A26	
R4400	0611077A80	
R4401,4402	0611077A26	
R4403	0611079A36	
R4404	0611079A12	

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TX1054A 30W PA Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R4406	0611079A36	27 ohms,1/10 W
R4407	0611079A60	270 ohms,1/10 W
R4409	0611072A41	470 ohms,1/4 W
R4410	0611077A57	200 ohms,1/8 W
R4411	0611079A55	RES FIXED CHIP 160 5 1/10W A/P
R4501	0662057A83	CHIP RES 27K OHMS
R4507,4508	0662057A73	CHIP RES 10K OHMS
R4509	0611079F81	RES CHIP 6.81K 1/10W 1% 0805
R4510	0662057A89	CHIP RES 47K OHMS
R4513	0662057A97	CHIP RES 100K OHMS
R4514	0662057A73	CHIP RES 10K OHMS
R4515	0662057A89	CHIP RES 47K OHMS
R4516	0662057B47	CHIP RES 0 OHMS +/-050 OHMS
R4518	0662057A65	CHIP RES 4700 OHMS
R4522	0662057A73	CHIP RES 10K OHMS
R4523	0662057A77	CHIP RES 15K OHMS
R4525	0662057A75	CHIP RES 12K OHMS
R4526	0662057A73	CHIP RES 10K OHMS
R4530	0662057A49	CHIP RES 1000 OHMS
R4532	0611077A74	1K,1/8 W
R4535	0662057A49	CHIP RES 1000 OHMS
R4537	0662057A49	CHIP RES 1000 OHMS
R4539	0662057A53	CHIP RES 1500 OHMS
R4540	0662057A49	CHIP RES 1000 OHMS
R4541	0662057A57	CHIP RES 2200 OHMS
R4543	0662057A57	CHIP RES 2200 OHMS
R4544	0611079F44	RES CHIP 2.80K 1/10W 1% 0805
R4545	0662057A49	CHIP RES 1000 OHMS
R4547	0662057A49	CHIP RES 1000 OHMS
R4554,4555	0662057A94	CHIP RES 75K OHMS
R4556	0662057A49	CHIP RES 1000 OHMS
R4557	0662057A57	CHIP RES 2200 OHMS
R4558	0611079F81	RES CHIP 6.81K 1/10W 1% 0805
R4559	0662057A49	CHIP RES 1000 OHMS
R4560	0662057A65	CHIP RES 4700 OHMS
R4562	0662057A49	CHIP RES 1000 OHMS
R4563	0682089V01	SMT .01 2W
R4564	0662057A53	CHIP RES 1500 OHMS
R4565	0662057A73	CHIP RES 10K OHMS
R4566	0662057A57	CHIP RES 2200 OHMS
R4567	0662057A49	CHIP RES 1000 OHMS
R4568	0662057A55	CHIP RES 1800 OHMS
R4569	0662057A79	CHIP RES 18K OHMS
R4570	0662057B04	CHIP RES 180K OHMS
R4571	0662057B05	CHIP RES 200K OHMS
R4572	0662057A73	CHIP RES 10K OHMS
R4577,4578	0662057A97	CHIP RES 100K OHMS
THERMISTOR:		
RT4501	0680149M02	100 k, +/-10%; 240 mW
INTEGRATED CIRCUIT: (SEE NOTE)		
U4504	5113816A07	5-Volt Positive Regulator
U4505	5113819A04	Quad Operational Amplifier
U4506	5113811A08	IC; 8-bit
U4507	5180057S02	IC CMOS CUST DA CONV 13" REEL
U4508	5113819A04	Quad Operational Amplifier
CABLE ASSEMBLY:		
W4000 to 4007	4282981X01	STRAP PA BRAIDED
W4201 to 4203	4282981X01	STRAP PA BRAIDED
W4204,4205	4283431X01	GROUND CLIP
W4206	4284952P02	CLIP JU
W4207	4284952P03	CLIP, JU
W4251 to 4253	4282981X01	STRAP PA BRAIDED
W4900	4282981X01	STRAP PA BRAIDED
NON-REFERENCED ITEMS		
	CTX4010A	PA,UHF,40W INPUT BD
	CTX4024A	PA,UHF,R4,30W,OUTPUT BD
	THN6795A	MODULE HOUSING PA LP W/CRCLTR
	TLE6091A	LPF & FINAL COUPLER 1R
	TLE9150A	UHF OMNI MODULE R1 & R2
	TTE6341A	PA 50W MODULE
	TTN5238A	CIRCULATOR LOAD
	0310907A40	SCRMCH(M4X0.7X25) STRPANSTLCAD (8 used)
	0312016A03	SCRTPG TT3X0.5X8 STARPAN (33 used)
	0383498N14	SCREW, tapping: M4 x 0.7 x 18 (2 used)
	0782106V01	BRACKET; low pass filter
	0783544X01	BRACKET, OMNI

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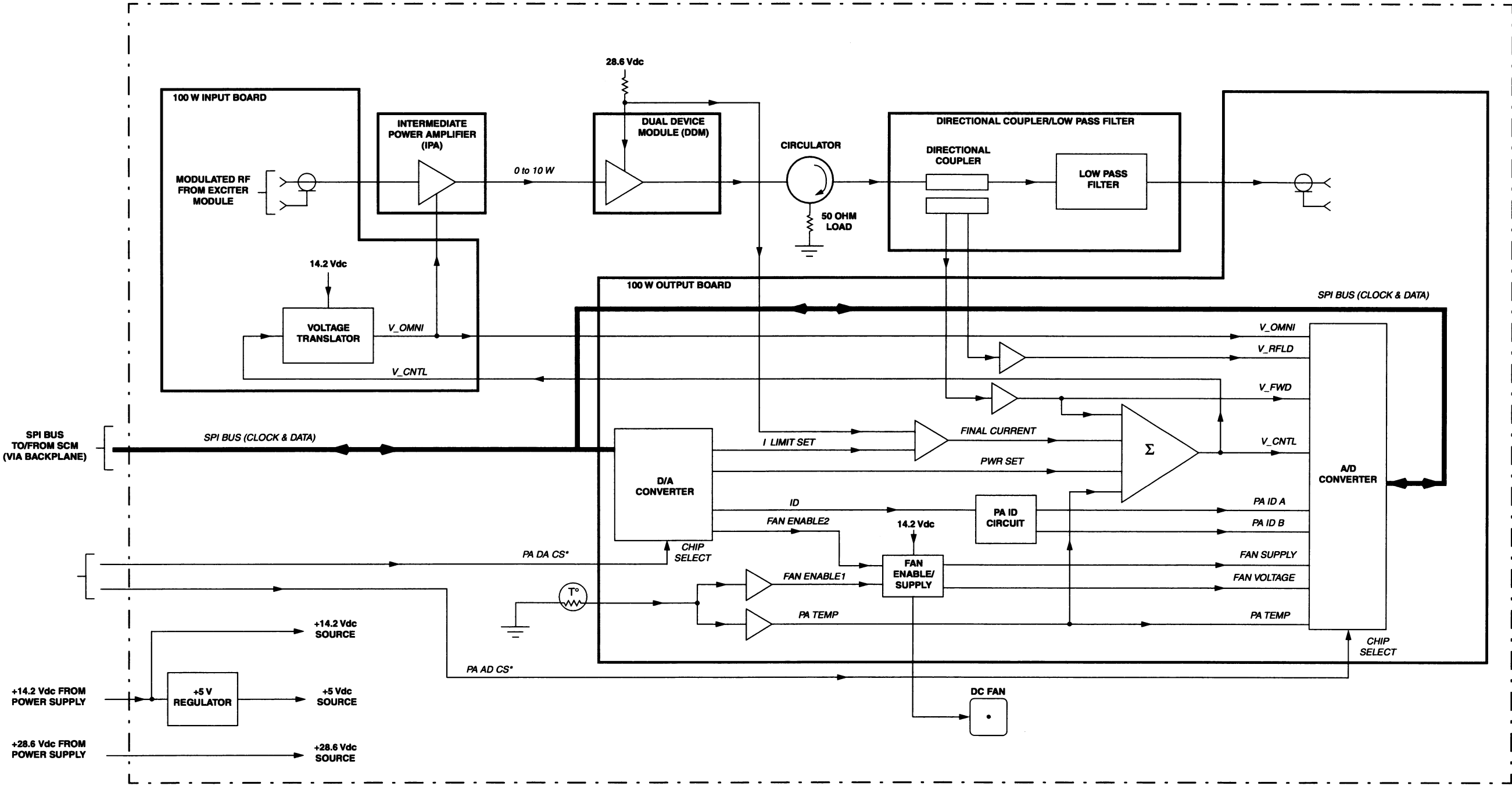
TTX1054A 30W PA Module (403 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	0900816159	CONNECTOR, receptacle: coaxial
	1582626X02	COVER PA & PS CASTING
	2682624X04	HEATSINK LOW POWER AMP
	3082728X05	CBL 6-WIRE
	3282170V01	GASKET RF (56 used)
	4385035U02	FLANGE circulator load (VHF)
	5482006W01	Label, PCB barcode
	5483323X01	LABEL, FREQ. REF.
	5484960T01	Label, barcode: 6.3 x 12.7mm, white (2 used)
	5884911T04	CIRCULATOR (2 used)
	6482474V01	PLATE
	6483129N01	PLATE, transistor mtg

Note: For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

100W PA MODULE
MODEL TTX1010A/TTX1020A

	TTX1010 403 to 435 MHz	TTX1020 435 to 470 MHz
IPA	TLE9150	
DDM	TTE6321	TTE6322
Coupler/LPF	TTE6331	TTE6332
Input Board	TTE6400	
Output Board	TTE6391	TTE6392
Circulator	5884911T04	



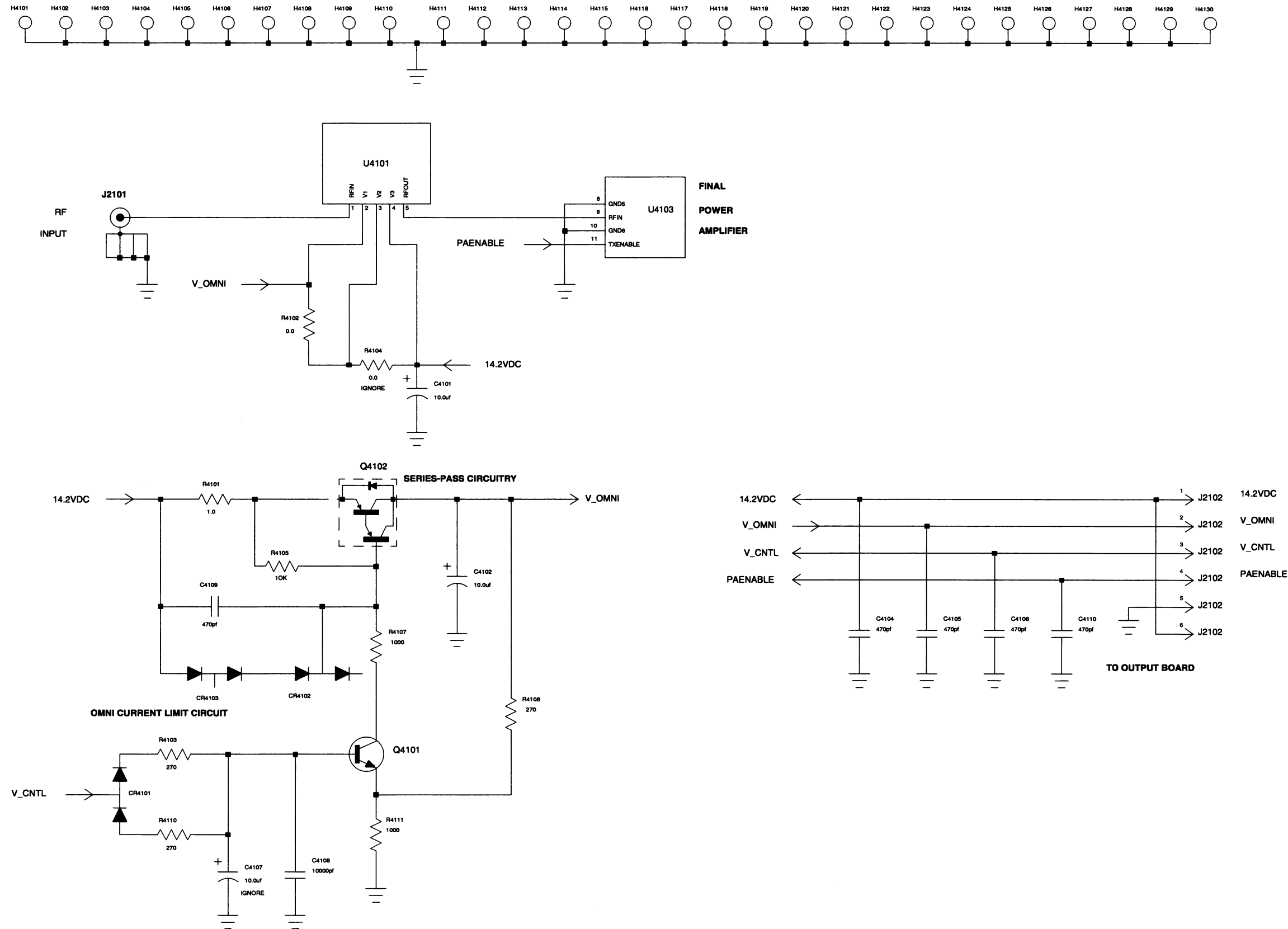
100W PA FUNCTIONAL BLOCK DIAGRAM

100W PA MODULE
MODEL TTX1010A/TTX1020A

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100W PA MODULE

MODEL TTX1010A/TTX1020A



TTE6400A 100W PA INPUT BOARD

100W PA MODULE
MODEL TTX1010A/TTX1020A

KIT DEPENDENT COMPONENTS

REF. DES	TTE6392A	TTE6391A	TTD6462A	TTD6461A	CTX4024A
C4502	100	100	470	470	100
C4508	100	100	470	470	NOT USED
C4509	100	100	470	470	NOT USED
C4512	47000	33000	47000	47000	47000
C4517	100	100	NOT USED	NOT USED	100
C4518	NOT USED	NOT USED	470	470	NOT USED
C4519	100	100	470	470	100
C4520	100	100	470	470	100
C4522	10 uF	10 uF	10 uF	10 uF	NOT USED
C4533	100	100	470	470	100
C4534	100	100	470	470	100
C4535	100	100	470	470	100
C4536	100	100	470	470	100
C4538	10 uF	10 uF	10 uF	10 uF	NOT USED
C4539	100	100	470	470	100
C4540	100	100	470	470	100
C4541	100	100	470	470	100
C4543	100	100	470	470	100
C4544	100	100	470	100	100
C4546	100	100	470	470	100
C4547	100	100	470	470	NOT USED
C4548	100	100	470	470	100
C4549	100	100	470	470	100
C4553	100 uF	100 uF	100 uF	100 uF	NOT USED
C4555	100	100	470	470	100
C4556	100	100	470	470	100
C4557	100	100	470	470	100
C4558	100	100	470	470	100
C4559	100	100	56	470	100
C4569	100	100	470	100	100
C4579	100	100	470	470	100
C4580	100	100	470	470	100
C4581	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
C4582	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
C4583	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
C4584	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
C4587	NOT USED	NOT USED	NOT USED	NOT USED	47000
L4511	FERRITE BEAD	FERRITE BEAD	FERRITE BEAD	FERRITE BEAD	NOT USED
L4513	FERRITE BEAD	FERRITE BEAD	FERRITE BEAD	FERRITE BEAD	NOT USED
Q4502	NPN TRNSTR	NPN TRNSTR	NPN TRNSTR	NPN TRNSTR	NOT USED
Q4503	P-CH TRNSTR	P-CH TRNSTR	P-CH TRNSTR	P-CH TRNSTR	NOT USED
R4501	27	27	27	27	27

NOTE: ALL VALUES IN pF OR KOHM UNLESS OTHERWISE MARKED

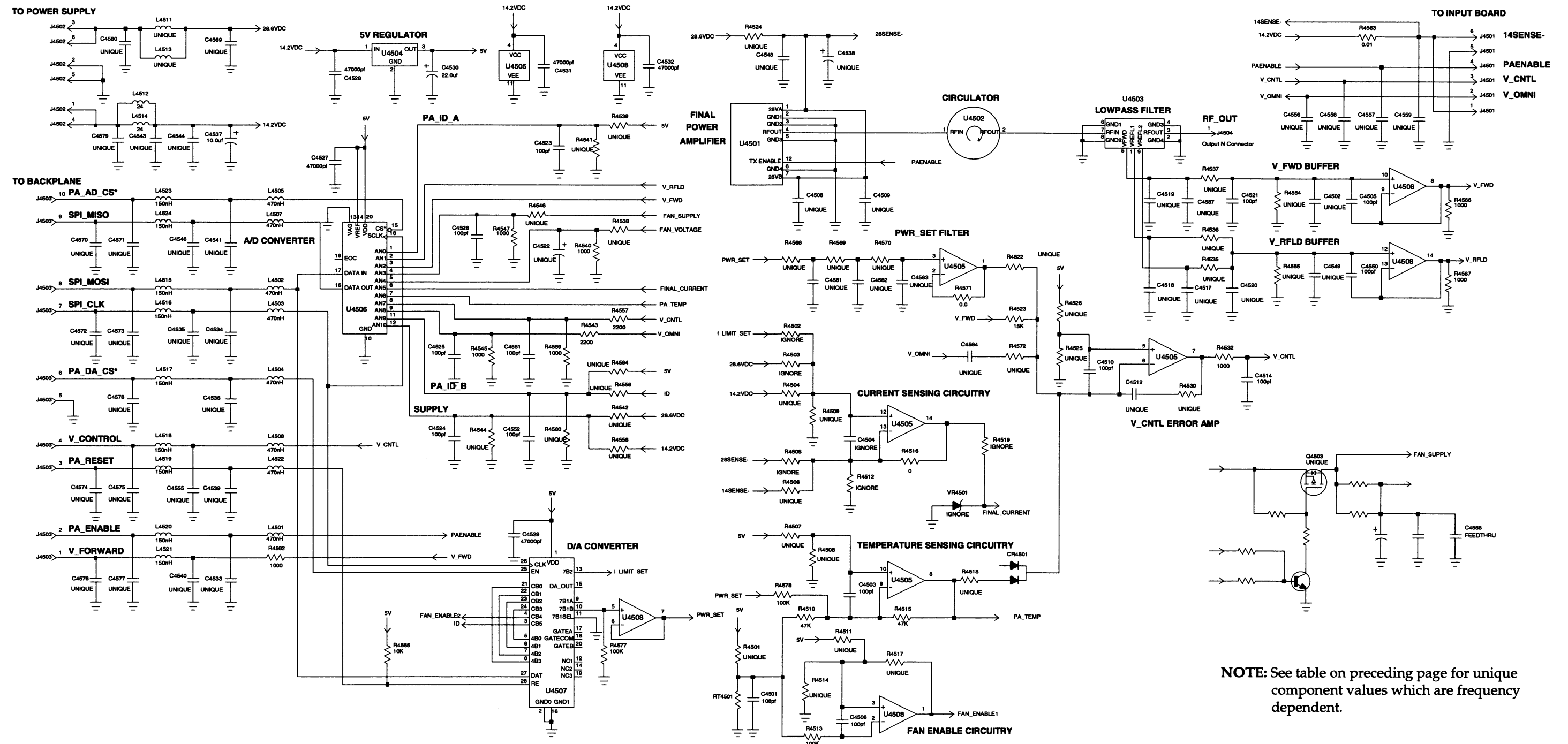
KIT DEPENDENT COMPONENTS

REF. DES	TTE6392A	TTE6391A	TTD6462A	TTD6461A	CTX4024A
R4503	NOT USED	NOT USED	20	20	NOT USED
R4504	NOT USED	NOT USED	NOT USED	NOT USED	15
R4505	NOT USED	NOT USED	20.5	20.5	NOT USED
R4506	NOT USED	NOT USED	NOT USED	NOT USED	15
R4507	10	10	10	10	10
R4508	10	10	10	10	10
R4509	5.76	5.76	5.76	5.76	6.81
R4511	1.5	1.5	1.5	1.5	NOT USED
R4512	NOT USED	NOT USED	5.76	5.76	6.81
R4514	2.2	2.2	2.2	2.2	10
R4517	100	100	100	100	NOT USED
R4518	6.8	6.8	6.8	6.8	4.7
R4524	0.01 Ohms	0.01 Ohms	0.01 Ohms	0.01 Ohms	NOT USED
R4525	12	12	12	12	12
R4526	10	10	10	10	10
R4530	1	1	1	1	1
R4535	27	27	NOT USED	NOT USED	1
R4536	NOT USED	NOT USED	27	27	NOT USED
R4537	27	27	27	27	1
R4538	2.2	2.2	2.2	2.2	NOT USED
R4539	1.5	1.5	2.2	2.2	1.5
R4541	2.2	2.2	1	1	2.2
R4542	31.6	31.6	31.6	31.6	NOT USED
R4544	5.76	5.76	5.76	5.76	2.8
R4546	2.2	2.2	2.2	2.2	NOT USED
R4548	10	10	10	10	NOT USED
R4549	10	10	10	10	NOT USED
R4550	10	10	10	10	NOT USED
R4551	1	1	1	1	NOT USED
R4552	9.1 Ohms	9.1 Ohms	9.1 Ohms	9.1 Ohms	NOT USED
R4553	9.1 Ohms	9.1 Ohms	9.1 Ohms	9.1 Ohms	NOT USED
R4554	47	47	47	47	75
R4555	47	47	47	47	75
R4556	2.2	2.2	2.2	2.2	1
R4558	NOT USED	NOT USED	NOT USED	NOT USED	6.81
R4560	1.5	15	1.5	15	4.7
R4564	1.5	15	1.5	15	1.5
R4568	0.0	0.0	0.0	0.0	0.0
R4569	0.0	0.0	0.0	0.0	0.0
R4570	0.0	0.0	0.0	0.0	0.0
R4572	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED

NOTE: ALL VALUES IN pF OR KOHM UNLESS OTHERWISE MARKED

100W PA MODULE

MODEL TTX1010A/TTX1020A



NOTE: See table on preceding page for unique component values which are frequency dependent.

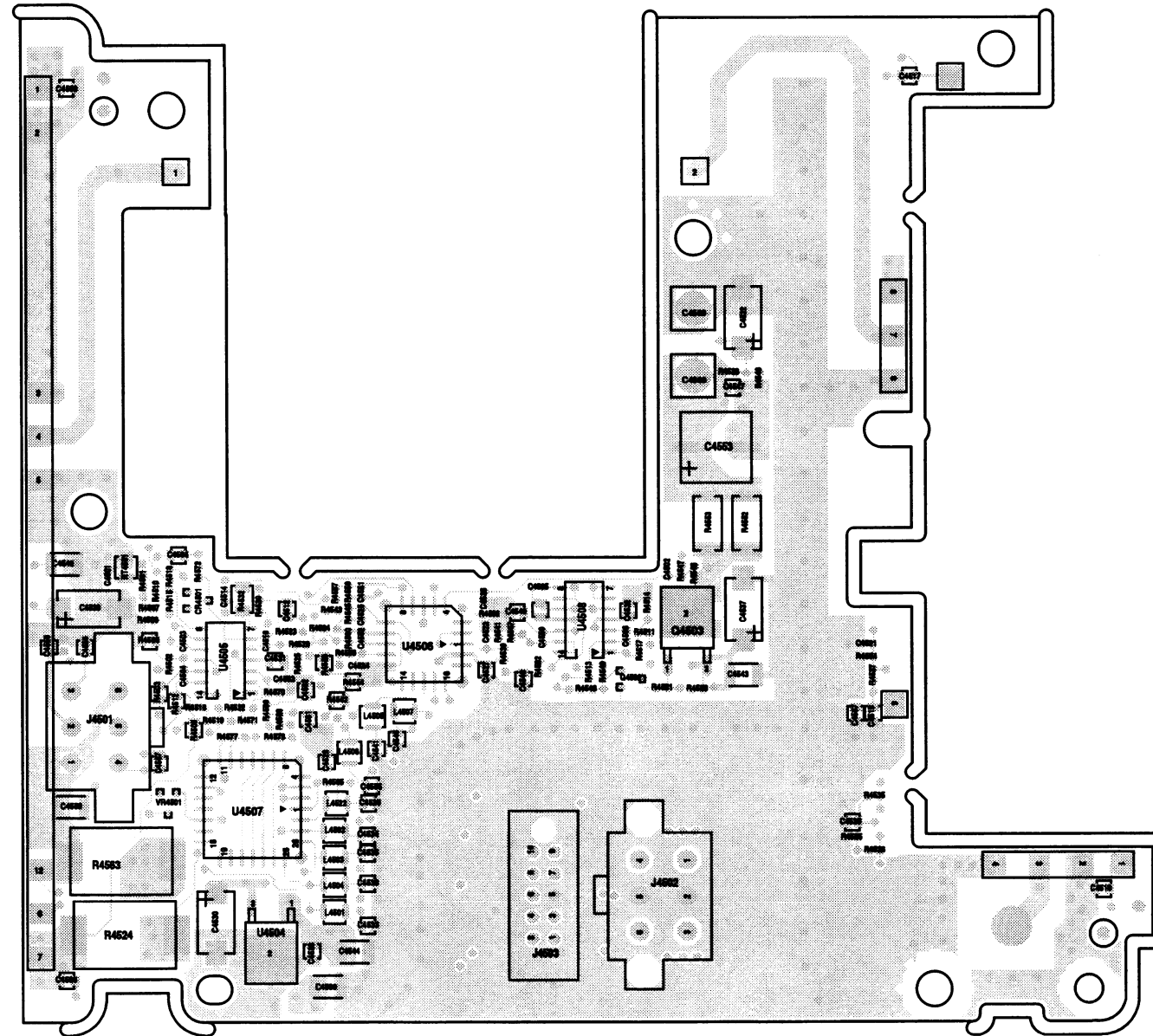
TTE6391A OR TTE6392A 100W PA OUTPUT BOARD

100W PA MODULE
MODEL TTX1010A/TTX1020A

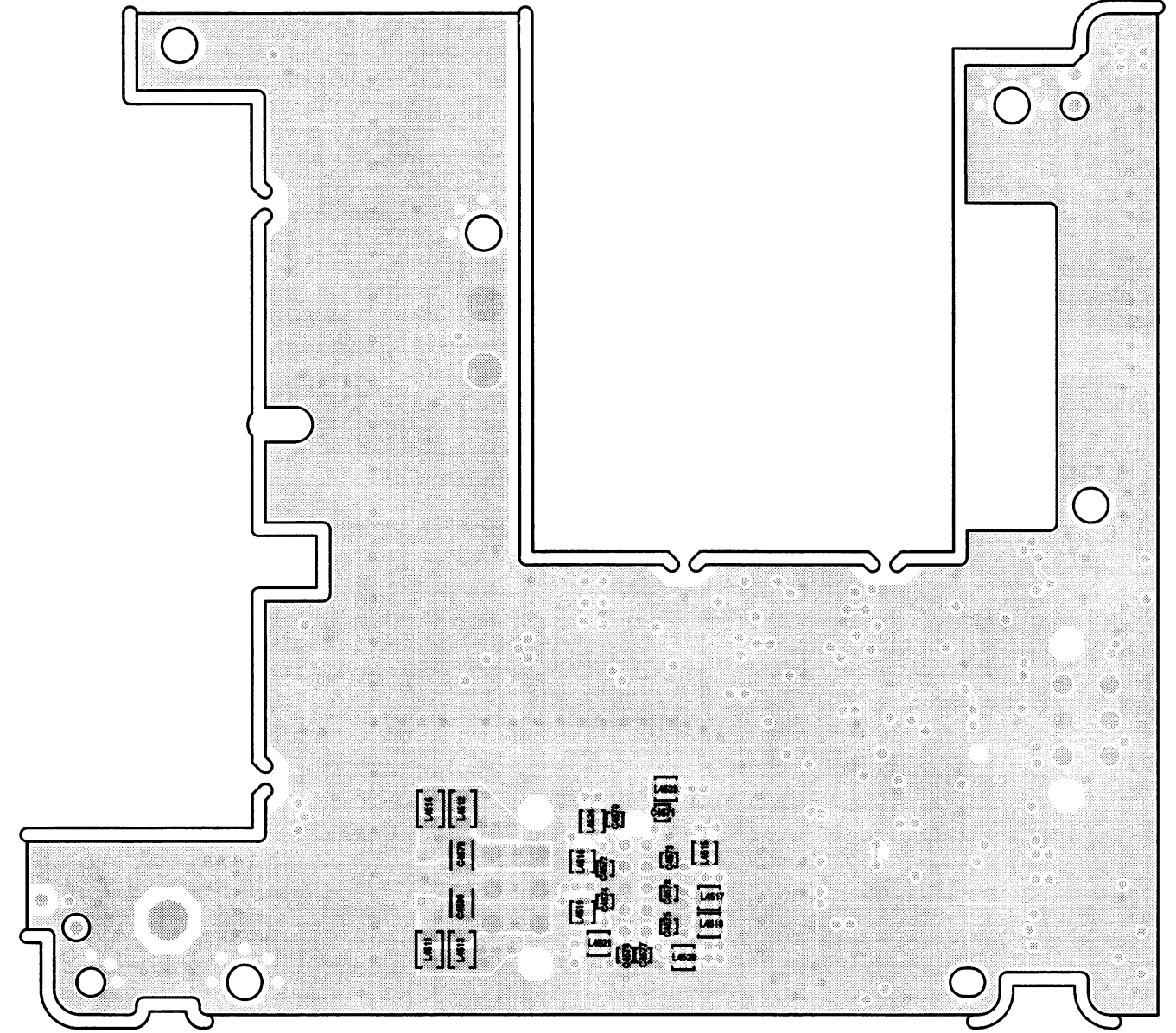
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100W PA MODULE

MODEL TTX1010A/TTX1020A



HEAVY COMPONENT SIDE



LIGHT COMPONENT SIDE

TTE6391A/TTE6392A 100W PA OUTPUT BOARD DETAIL

Parts List

TTX1010A 100 W PA Module (403 to 435MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
CAPACITOR, FIXED: UF +/-10%; 100 V:		
UNLESS OTHERWISE STATED		
C4000	2113901C17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C4001	2113901C31	CAP CHIP HI Q 12 PF +/- 5%
C4002,4003	2113901C27	CAP CHIP HI Q 8.2 PF +/-0.50PF
C4004	2113901C20	CAP CHIP HI Q 4.3 PF +/-0.25PF
C4006,4007	2113740A53	82 pF, +/-5%; 50 V
C4101,4102	2311049A45	10 uF, +/-10%; 35 V
C4104 to 4106	2113740A71	470 pF, +/-5%; 50 V
C4108	2113741A45	0.01 uF, +/-5%; 50 V
C4109,4110	2113740A71	470 pF, +/-5%; 50 V
C4202 to 4205	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4206	2113901C29	CAP CHIP HI Q 10 PF +/-0.50PF
C4207	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4209	2113901C66	CAP CHIP HI Q 200 PF +/- 5%
C4210	2113741B45	0.01 uF, +/-5%; 50 V
C4211,4212	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4213	2113741B69	0.1 uF, +/-5%; 50 V
C4214	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4215,4216	2113901C37	CAP CHIP HI Q 20 PF +/- 5%
C4217	2113741B45	0.01 uF, +/-5%; 50 V
C4218,4219	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4220	2113741B69	0.1 uF, +/-5%; 50 V
C4221,4222	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4223	2113901C29	CAP CHIP HI Q 10 PF +/-0.50PF
C4225	2113901C29	CAP CHIP HI Q 10 PF +/-0.50PF
C4226	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4228,4229	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4230	2113901C29	CAP CHIP HI Q 10 PF +/-0.50PF
C4231	2113901C41	CAP CHIP HI Q 27 PF +/- 5%
C4232	2113741B69	0.1 uF, +/-5%; 50 V
C4233	2113901C40	CAP CHIP HI Q 25 PF +/- 5%
C4234,4235	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4236	2113901C41	CAP CHIP HI Q 27 PF +/- 5%
C4237	2113901C40	CAP CHIP HI Q 25 PF +/- 5%
C4238	2113741B69	0.1 uF, +/-5%; 50 V
C4239 to 4241	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4242,4243	2113901C17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C4244 to 4246	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4247	2113901C29	CAP CHIP HI Q 10 PF +/-0.50PF
C4248	2113901C66	CAP CHIP HI Q 200 PF +/- 5%
C4251,4252	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4257	2113901C66	CAP CHIP HI Q 200 PF +/- 5%
C4259	2113901C66	CAP CHIP HI Q 200 PF +/- 5%
C4260	2113901C29	CAP CHIP HI Q 10 PF +/-0.50PF
C4261	2113901C36	CAP CHIP HI Q 18 PF +/- 5%
C4262,4263	2113741B69	0.1 uF, +/-5%; 50 V
C4264	2113901C36	CAP CHIP HI Q 18 PF +/- 5%
C4265,4266	2113741B45	0.01 uF, +/-5%; 50 V
C4267,4268	2113901C29	CAP CHIP HI Q 10 PF +/-0.50PF
C4270 to 4273	2113901C17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C4274,4275	2113901C37	CAP CHIP HI Q 20 PF +/- 5%
C4276,4277	2113901C48	CAP CHIP HI Q 39 PF +/- 5%
C4400	2113740A28	9.1 pF, +/-0.25 pF; 50V
C4401	2113741B69	0.1 uF, +/-5%; 50 V
C4402	2113740A36	20 pF, +/-5%; 50V
C4403	2113740A65	270 pF, +/-5%; 50V
C4404	2113740B49	100 pF, +/-5%; 50 V
C4405	2113740A21	5.6 pF, +/-0.25 pF; 50 V
C4406	2113740A40	30 pF, +/-5%; 50 V
C4407	2113740A65	270 pF, +/-5%; 50V
C4408	2113741B69	0.1 uF, +/-5%; 50 V
C4409	2113740A48	51 pF, +/-5%; 50V
C4410	2113740A29	10 pF, +/-5%; 50 V
C4411	2113740A55	100 pF, +/-5%; 50 V
C4412	2113740A38	24 pF, +/-5%; 50 V
C4413 to 4415	2113901C53	CAP CHIP HI Q 62 PF +/- 5%
C4416	2113901C40	CAP CHIP HI Q 25 PF +/- 5%
C4417	2113740B23	8.2 pF, +/-0.25 pF; 50V
C4418	2113741B69	0.1 uF, +/-5%; 50 V
C4419	2113740A55	100 pF, +/-5%; 50 V
C4501	2113740F51	100 pF, +/-5%; 50V
C4502	2113740A55	100 pF, +/-5%; 50 V
C4503	2113740F51	100 pF, +/-5%; 50V
C4505,4506	2113740F51	100 pF, +/-5%; 50V
C4508,4509	2113740A55	100 pF, +/-5%; 50 V
C4510	2113740F51	100 pF, +/-5%; 50V
C4512	2113741A57	0.033 uF, +/-5%; 50 V
C4514	2113740F51	100 pF, +/-5%; 50V
C4517	2113740A55	100 pF, +/-5%; 50 V
C4519,4520	2113740A55	100 pF, +/-5%; 50 V

TTX1010A 100 W PA Module (403 to 435MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C4521	2113740F51	100 pF, +/-5%; 50V
C4522	2311049A45	10 uF, +/-10%; 35 V
C4523 to 4526	2113740F51	100 pF, +/-5%; 50V
C4527 to 4529	2113741A61	0.047 uF, +/-5%; 50 V
C4530	2311049A21	22 uF, +/-10%; 20 V
C4531,4532	2113741A61	0.047 uF, +/-5%; 50 V
C4533 to 4536	2113740A55	100 pF, +/-5%; 50 V
C4537,4538	2311049A45	10 uF, +/-10%; 35 V
C4539 to 4541	2113740A55	100 pF, +/-5%; 50 V
C4543,4544	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4546,4547	2113740A55	100 pF, +/-5%; 50 V
C4548	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4549	2113740A55	100 pF, +/-5%; 50 V
C4550 to 4552	2113740F51	100 pF, +/-5%; 50V
C4553	2380090M36	CAP 100 UF 25V
C4555 to 4558	2113740A55	100 pF, +/-5%; 50 V
C4559	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4569	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4570 to 4578	2113740A27	8.2 pF, +/-0.25 pF; 50 V
C4579,4580	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
DIODE: (SEE NOTE)		
CR4000,4001	4882290T04	Diode; hot carrier
CR4101 to 4103	4813833C05	dual 70 V
CR4201	4882290T04	Diode; hot carrier
CR4202	4813830A15	Zener, 5.6 V
CR4400	4813833C05	dual 70 V
CR4501	4813833C02	Dual diode; common cathode
CONNECTOR, RECEPTACLE:		
J2101	0982492W01	BNC CONN PCB VERTICAL RECEPT
J2102	2884490T03	HDR 2X3 VERT PWR
J4501,4502	2884490T03	HDR 2X3 VERT PWR
CONNECTOR, PLUG:		
J4503	2885155U01	plug, 10-contact
COIL, INDUCTOR:		
L4000	2483035N77	COIL AIR WOUND 3T 16G 12NH
L4001,4002	2480090G19	COIL AIRWOUND
L4003	2483035N77	COIL AIR WOUND 3T 16G 12NH
L4004	2411087A06	0.022 uH
L4005	2411087A17	COIL; chip .18 uH
L4006,4007	2411087A08	0.033 uH
L4008	2411087A17	COIL; chip .18 uH
L4009	2411087A06	0.022 uH
L4200	2484657R01	ferrite bead
L4201,4202	2460591G77	COIL AIR WOUND INDUC 43.30
L4203	2484657R01	ferrite bead
L4206	2484657R01	ferrite bead
L4209	2484657R01	ferrite bead
L4210	2411087A09	.039 uH
L4211	2411087A08	0.033 uH
L4212	2411087A18	COIL CHIP .22 uH
L4213,4214	2484657R01	ferrite bead
L4400	2411087A02	0.010 uH
L4402	2484657R01	ferrite bead
L4403,4404	2411087A02	0.010 uH
L4407	2484657R01	ferrite bead
L4408	2462587X41	IND CHIP LO-PRO 10.0 NH 5%
L4409	2411087A07	0.027 uH
L4410,4411	2484657R01	ferrite bead
L4412,4413	2460591A01	COIL AIR WOUND INDUC 4.22
L4501 to 4505	2462587X61	IND CHIP LO-PRO 470 NH 5%
L4507,4508	2462587X61	IND CHIP LO-PRO 470 NH 5%
L4511 to 4514	2484657R01	ferrite bead
L4515 to 4521	2462587X55	IND CHIP LO-PRO 150 NH 5%
L4522	2462587X61	IND CHIP LO-PRO 470 NH 5%
L4523,4524	2462587X55	IND CHIP LO-PRO 150 NH 5%
TRANSISTOR: (SEE NOTE)		
Q4101	4813824A10	NPN
Q4102	4813822D08	Transistor; 100 V
Q4200 to 4203	4882233P68	TSTR FE N-CH ENH MODE SRF33P68
Q4204	4813824A17	PNP
Q4205	4813824A10	NPN
Q4400	4813827A26	Transistor; NPN
Q4401	4882233P53	NPN
Q4402	4882233P54	Transistor; NPN
Q4502	4813824A10	NPN
Q4503	4813821A09	Transistor; 60 V

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TTX1010A 100 W PA Module (403 to 435MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
RESISTOR, FIXED: +/-5%; 1/16 W: UNLESS OTHERWISE STATED		
R4000	0611077A42	47 ohms, 1/8 W
R4001	0611077A60	270 ohms, 1/8 W
R4002	0611077A42	47 ohms, 1/8 W
R4003	0611077A56	180 ohms, 1/8 W
R4004	0611077A60	270 ohms, 1/8 W
R4005	0611077A56	180 ohms, 1/8 W
R4101	0683962T01	1 ohm, 1 W
R4102	0611079A01	0 ohms, 1/10 W
R4103	0611079A60	270 ohms, 1/10 W
R4105	0611079A98	10K, 1/10 W
R4107	0611072A49	1K, 1/4 W
R4108	0611072A35	270 ohms, 1/4W
R4110	0611079A60	270 ohms, 1/10 W
R4111	0611072A49	1K, 1/4 W
R4200 to 4203	0611077A98	10K, 1/8 W
R4204 to 4209	0611072A01	10 ohms, 1/4 W
R4212	0611072A61	3.3K, 1/4W
R4213	0611072A25	100 ohms, 1/4 W
R4214	0611077A43	51 ohms, 1/8 W
R4215	0611072A49	1K, 1/4 W
R4221,4222	0611072A01	10 ohms, 1/4 W
R4223,4224	0611072A25	100 ohms, 1/4 W
R4225	0611077B15	47K, 1/8 W
R4226	0611077B03	15K, 1/8 W
R4227	0611077A98	10K, 1/8 W
R4228	0611077B23	100K, 1/8 W
R4229	0611072A63	3900 ohms, 1/4W
R4230	0611077A01	0 ohm, 0 W
R4400	0611077A80	1.8K, 1/8 W
R4401,4402	0611077A26	10 ohms, 1/8 W
R4403	0611079A36	27 ohms, 1/10 W
R4404	0611079A12	2.7 ohms, 1/10 W
R4406	0611079A36	27 ohms, 1/10 W
R4407	0611079A60	270 ohms, 1/10 W
R4409	0611072A41	470 ohms, 1/4 W
R4410	0611077A57	200 ohms, 1/8 W
R4411	0611079A55	RES FIXED CHIP 160 5 1/10W A/P
R4501	0662057A83	CHIP RES 27K OHMS
R4507,4508	0662057A73	CHIP RES 10K OHMS
R4509	0611079F74	RES CHIP 5.76K 1/10W 1% 0805
R4510	0662057A89	CHIP RES 47K OHMS
R4511	0662057A53	CHIP RES 1500 OHMS
R4513	0662057A97	CHIP RES 100K OHMS
R4514	0662057A57	CHIP RES 2200 OHMS
R4515	0662057A89	CHIP RES 47K OHMS
R4516	0662057B47	CHIP RES 0 OHMS +/- .050 OHMS
R4517	0662057A97	CHIP RES 100K OHMS
R4518	0662057A69	CHIP RES 6800 OHMS
R4522	0662057A73	CHIP RES 10K OHMS
R4523	0662057A77	CHIP RES 15K OHMS
R4524	0682089V01	SMT .01 2W
R4525	0662057A75	CHIP RES 12K OHMS
R4526	0662057A73	CHIP RES 10K OHMS
R4530	0662057A49	CHIP RES 1000 OHMS
R4532	0611077A74	1K, 1/8 W
R4535	0662057A83	CHIP RES 27K OHMS
R4537	0662057A83	CHIP RES 27K OHMS
R4538	0662057A57	CHIP RES 2200 OHMS
R4539	0662057A53	CHIP RES 1500 OHMS
R4540	0662057A49	CHIP RES 1000 OHMS
R4541	0662057A57	CHIP RES 2200 OHMS
R4542	0611079G49	31.6K, 1/10W; +/-1%
R4543	0662057A57	CHIP RES 2200 OHMS
R4544	0611079F74	RES CHIP 5.76K 1/10W 1% 0805
R4545	0662057A49	CHIP RES 1000 OHMS
R4546	0662057A57	CHIP RES 2200 OHMS
R4547	0662057A49	CHIP RES 1000 OHMS
R4548 to 4550	0662057A73	CHIP RES 10K OHMS
R4551	0662057A49	CHIP RES 1000 OHMS
R4552,4553	0683962T24	9.1 ohms, 1 W
R4554,4555	0662057A89	CHIP RES 47K OHMS
R4556,4557	0662057A57	CHIP RES 2200 OHMS
R4559	0662057A49	CHIP RES 1000 OHMS
R4560	0662057A77	CHIP RES 15K OHMS
R4562	0662057A49	CHIP RES 1000 OHMS
R4563	0682089V01	SMT .01 2W
R4564	0662057A77	CHIP RES 15K OHMS
R4565	0662057A73	CHIP RES 10K OHMS
R4566,4567	0662057A49	CHIP RES 1000 OHMS

TTX1010A 100 W PA Module (403 to 435MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R4568 to 4571	0662057B47	CHIP RES 0 OHMS +/- .050 OHMS
R4577,4578	0662057A97	CHIP RES 100K OHMS
THERMISTOR:		
RT4501	0680149M02	100 k, +/-10%; 240 mW
INTEGRATED CIRCUIT: (SEE NOTE)		
U4504	5113816A07	5-Volt Positive Regulator
U4505	5113819A04	Quad Operational Amplifier
U4506	5113811A08	IC; 8-bit
U4507	5180057S02	IC CMOS CUST DA CONV 13" REEL
U4508	5113819A04	Quad Operational Amplifier
CABLE ASSEMBLY:		
W4000 to 4007	4282981X01	STRAP PA BRAIDED
W4200 to 4207	2982412V01	TRANSISTOR LEAD
W4208 to 4217	4282981X01	STRAP PA BRAIDED
W4222,4223	4282981X01	STRAP PA BRAIDED
W4900	4282981X01	STRAP PA BRAIDED
NON-REFERENCED ITEMS		
	THN6786A	MODULE HOUSING PA HIGH POWER
	TLE9150A	UHF OMNI MODULE R1 & R2
	TTE6321B	R 1 UHF DDM
	TTE6331A	R1 UHF LPF/COUPLER
	TTE6391A	PA,UHF,100W,OUTPUT BD,R1
	TTE6400A	PA,UHF,100W,INPUT BD
	TTN5238A	CIRCULATOR LOAD
	0310907A40	SCRMCH(M4X0.7X25) STRPANSTLCAD (8 used)
	0310907C66	SCRMCH M4X0.7X45MM STL CAD (4 used)
	0310917A51	SCRMCH M3.5X0.6X12 STPN STLZNC (3 used)
	0312016A03	SCRTPG TT3X0.5X8 STARPAN (26 used)
	0782106V01	BRACKET; low pass filter
	0783544X01	BRACKET, OMNI
	0900816159	CONNECTOR, receptacle: coaxial
	1383852R01	GRILLE, fan
	1582626X02	COVER PA & PS CASTING
	2182805H05	1000 pF, +/-0%; 200V (2 used)
	2682624X03	HEATSINK HIGH POWER AMP
	3082728X05	CBL 6-WIRE
	3282170V01	GASKET RF (56 used)
	4382314W02	FLANGE 280MHZ DDM
	4385035U02	FLANGE circulator load (VHF)
	5482006W01	Label, PCB barcode
	5483323X01	LABEL, FREQ. REF.
	5484960T01	Label, barcode: 6.3 x 12.7mm, white (2 used)
	5884911T04	CIRCULATOR
	5983663R09	FAN DC 1" THK X120MMX120MM
	6482474V01	PLATE

Note: For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

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Parts List (Sheet 10 of 12)

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Parts List

TTX1020A 100 W PA Module (435 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
CAPACITOR, FIXED: UF +/-10%; 100 V: UNLESS OTHERWISE STATED		
C4000	2113901C21	CAP CHIP HI Q 4.7 PF +/-0.25PF
C4001	2113901C19	CAP CHIP HI Q 3.9 PF +/-0.25PF
C4002	2113901C25	CAP CHIP HI Q 6.8 PF +/-0.50PF
C4003	2113901C33	CAP CHIP HI Q 14 PF +/- 5%
C4004	2113901C28	CAP CHIP HI Q 9.1 PF +/-0.50PF
C4005,4006	2113740A51	68 pF, +/-5%; 50 V
C4007,4008	2113740G25	7.5 pF, +/-0.1 pF; 50V
C4101,4102	2311049A45	10 uF, +/-10%; 35 V
C4104 thru 4106	2113740A71	470 pF, +/-5%; 50 V
C4108	2113741A45	0.01 uF, +/-5%; 50 V
C4109	2113740A71	470 pF, +/-5%; 50 V
C4202 thru 4205	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4206	2113901C21	CAP CHIP HI Q 4.7 PF +/-0.25PF
C4207	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4209	2113901C66	CAP CHIP HI Q 200 PF +/- 5%
C4210	2113741B45	0.01 uF, +/-5%; 50 V
C4211,4212	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4213	2113741B69	0.1 uF, +/-5%; 50 V
C4214	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4215,4216	2113901C29	CAP CHIP HI Q 10 PF +/-0.50PF
C4217	2113741B45	0.01 uF, +/-5%; 50 V
C4218,4219	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4220	2113741B69	0.1 uF, +/-5%; 50 V
C4221,4222	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4223	2113901C21	CAP CHIP HI Q 4.7 PF +/-0.25PF
C4225	2113901C29	CAP CHIP HI Q 10 PF +/-0.50PF
C4226	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4228,4229	2113901C56	CAP CHIP HI Q 82 PF +/- 5%
C4230	2113901C29	CAP CHIP HI Q 10 PF +/-0.50PF
C4231	2113901C41	CAP CHIP HI Q 27 PF +/- 5%
C4232	2113741B69	0.1 uF, +/-5%; 50 V
C4233	2113901C37	CAP CHIP HI Q 20 PF +/- 5%
C4234,4235	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4236	2113901C41	CAP CHIP HI Q 27 PF +/- 5%
C4237	2113901C37	CAP CHIP HI Q 20 PF +/- 5%
C4238	2113741B69	0.1 uF, +/-5%; 50 V
C4239	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4240,4241	2113901C56	CAP CHIP HI Q 82 PF +/- 5%
C4242,4243	2113901C17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C4244 thru 4246	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4247	2113901C17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C4248	2113901C66	CAP CHIP HI Q 200 PF +/- 5%
C4251,4252	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4257	2113901C66	CAP CHIP HI Q 200 PF +/- 5%
C4259	2113901C66	CAP CHIP HI Q 200 PF +/- 5%
C4260	2113901C17	CAP CHIP HI Q 3.3 PF +/-0.25PF
C4261	2113901C37	CAP CHIP HI Q 20 PF +/- 5%
C4262,4263	2113741B69	0.1 uF, +/-5%; 50 V
C4264	2113901C37	CAP CHIP HI Q 20 PF +/- 5%
C4265,4266	2113741B45	0.01 uF, +/-5%; 50 V
C4267,4268	2113901C36	CAP CHIP HI Q 18 PF +/- 5%
C4270,4271	2113901C25	CAP CHIP HI Q 6.8 PF +/-0.50PF
C4274 thru 4277	2113901C37	CAP CHIP HI Q 20 PF +/- 5%
C4400	2113740A28	9.1 pF, +/-0.25 pF; 50V
C4401	2113741B69	0.1 uF, +/-5%; 50 V
C4402	2113740A36	20 pF, +/-5%; 50V
C4403	2113740A65	270 pF, +/-5%; 50V
C4404	2113740B49	100 pF, +/-5%; 50 V
C4405	2113740A21	5.6 pF, +/-0.25 pF; 50 V
C4406	2113740A40	30 pF, +/-5%; 50 V
C4407	2113740A65	270 pF, +/-5%; 50V
C4408	2113741B69	0.1 uF, +/-5%; 50 V
C4409	2113740A48	51 pF, +/-5%; 50V
C4410	2113740A29	10 pF, +/-5%; 50 V
C4411	2113740A55	100 pF, +/-5%; 50 V
C4412	2113740A38	24 pF, +/-5%; 50 V
C4413 thru 4415	2113901C53	CAP CHIP HI Q 62 PF +/- 5%
C4416	2113901C40	CAP CHIP HI Q 25 PF +/- 5%
C4417	2113740B23	8.2 pF, +/-0.25 pF; 50V
C4418	2113741B69	0.1 uF, +/-5%; 50 V
C4419	2113740A55	100 pF, +/-5%; 50 V
C4501	2113740F51	100 pF, +/-5%; 50V
C4502	2113740A55	100 pF, +/-5%; 50 V
C4503 thru 4506	2113740F51	100 pF, +/-5%; 50V
C4508,4509	2113740A55	100 pF, +/-5%; 50 V
C4510	2113740F51	100 pF, +/-5%; 50V
C4512	2113741A61	0.047 uF, +/-5%; 50 V
C4514	2113740F51	100 pF, +/-5%; 50V
C4517	2113740A55	100 pF, +/-5%; 50 V

TTX1020A 100 W PA Module (435 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C4519,4520	2113740A55	100 pF, +/-5%; 50 V
C4521	2113740F51	100 pF, +/-5%; 50V
C4522	2311049A45	10 uF, +/-10%; 35 V
C4523 thru 4526	2113740F51	100 pF, +/-5%; 50V
C4527 thru 4529	2113741A61	0.047 uF, +/-5%; 50 V
C4530	2311049A21	22 uF, +/-10%; 20 V
C4531,4532	2113741A61	0.047 uF, +/-5%; 50 V
C4533 thru 4536	2113740A55	100 pF, +/-5%; 50 V
C4537,4538	2311049A45	10 uF, +/-10%; 35 V
C4539 thru 4541	2113740A55	100 pF, +/-5%; 50 V
C4543,4544	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4546,4547	2113740A55	100 pF, +/-5%; 50 V
C4548	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4549	2113740A55	100 pF, +/-5%; 50 V
C4550 thru 4552	2113740F51	100 pF, +/-5%; 50V
C4553	2380090M36	CAP 100 UF 25V
C4555 thru 4558	2113740A55	100 pF, +/-5%; 50 V
C4559	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4569	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
C4570 thru 4578	2113740A27	8.2 pF, +/-0.25 pF; 50 V
C4579,4580	2113901C58	CAP CHIP HI Q 100 PF +/- 5%
		DIODE: (SEE NOTE)
CR4000,4001	4882290T04	Diode; hot carrier
CR4101 thru 4103	4813833C05	dual 70 V
CR4201	4882290T04	Diode; hot carrier
CR4202	4813830A15	Zener, 5.6 V
CR4400	4813833C05	dual 70 V
CR4501	4813833C02	Dual diode; common cathode
		CONNECTOR, RECEPTACLE:
J2101	0982492W01	BNC CONN PCB VERTICAL RECEPT
J2102	2884490T03	HDR 2X3 VERT PWR
J4501,4502	2884490T03	HDR 2X3 VERT PWR
J4503	2885155U01	plug, 10-contact inductor:
L4000	2483035N77	COIL AIR WOUND 3T 16G 12NH
L4001,4002	2480090G19	COIL AIRWOUND
L4003	2483035N77	COIL AIR WOUND 3T 16G 12NH
L4004	2462587X43	IND CHIP LO-PRO 15.0 NH 5%
L4005	2411087A18	COIL CHIP .22 UH
L4006,4007	2462587X46	IND CHIP LO-PRO 27.0 NH 5%
L4008	2411087A18	COIL CHIP .22 UH
L4009	2462587X43	IND CHIP LO-PRO 15.0 NH 5%
L4200	2484657R01	ferrite bead
L4201,4202	2460591G77	COIL AIR WOUND INDUC 43.30
L4203	2484657R01	ferrite bead
L4206	2484657R01	ferrite bead
L4209	2484657R01	ferrite bead
L4210,4211	2411087A07	0.027 uH
L4212	2411087A18	COIL CHIP .22 UH
L4213,4214	2484657R01	ferrite bead
L4400	2411087A02	0.010 uH
L4402	2484657R01	ferrite bead
L4403,4404	2411087A02	0.010 uH
L4407	2484657R01	ferrite bead
L4408	2462587X41	IND CHIP LO-PRO 10.0 NH 5%
L4409	2411087A07	0.027 uH
L4410,4411	2484657R01	ferrite bead
L4412,4413	2460591A01	COIL AIR WOUND INDUC 4.22
L4501 thru 4505	2462587X61	IND CHIP LO-PRO 470 NH 5%
L4507,4508	2462587X61	IND CHIP LO-PRO 470 NH 5%
L4511 thru 4514	2484657R01	ferrite bead
L4515 thru 4518	2462587X55	IND CHIP LO-PRO 150 NH 5%
L4520,4521	2462587X55	IND CHIP LO-PRO 150 NH 5%
L4523,4524	2462587X55	IND CHIP LO-PRO 150 NH 5%
		TRANSISTOR: (SEE NOTE)
Q4101	4813824A10	NPN
Q4102	4813822D08	Transistor; 100 V
Q4200 thru 4203	4882233P68	TSTR FE N-CH ENH MODE SRF33P68
Q4400	4813827A26	Transistor; NPN
Q4401	4882233P53	NPN
Q4402	4882233P54	Transistor; NPN
Q4502	4813824A10	NPN
Q4503	4813821A09	Transistor; 60 V
		RESISTOR, FIXED: +/-5%; 1/16 W: UNLESS OTHERWISE STATED
R4000	0611077A46	68 ohms, +/-5%; 1/8W
R4001	0611077A59	240 ohms, +/-5%; 1/8 W

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TTX1020A 100 W PA Module (435 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R4002	0611077A46	68 ohms, +/-5%; 1/8W
R4003	0611077A56	180 ohms, +/-5%; 1/8W
R4004	0611077A59	240 ohms, +/-5%; 1/8 W
R4005	0611077A56	180 ohms, +/-5%; 1/8W
R4101	0683962T01	1 ohm, +/-5%; 1 W
R4102	0611079A01	0 ohms, +/-5%; 1/10 W
R4103	0611079A60	270 ohms, +/-5%; 1/10 W
R4105	0611079A98	10K, +/-5%; 1/10 W
R4107	0611072A49	1K, +/-5%, 1/4 W
R4108	0611072A35	270 ohms, +/-5%; 1/4W
R4110	0611079A60	270 ohms, +/-5%; 1/10 W
R4111	0611072A49	1K, +/-5%, 1/4 W
R4200 thru 4203	0611077A98	10K, +/-5%; 1/8 W
R4204 thru 4209	0611072A01	10 ohms, +/-5%; 1/4 W
R4212	0611072A61	3.3K, +/-5%; 1/4W
R4213	0611072A25	100 ohms, +/-5%; 1/4 W
R4214	0611077A43	51 ohms, +/-5%; 1/8 W
R4215	0611072A49	1K, +/-5%, 1/4 W
R4221,4222	0611072A01	10 ohms, +/-5%; 1/4 W
R4223,4224	0611072A25	100 ohms, +/-5%; 1/4 W
R4400	0611077A80	1.8K, +/-5%; 1/8 W
R4401,4402	0611077A26	10 ohms, +/-5%; 1/8 W
R4403	0611079A36	27 ohms, +/-5%; 1/10 W
R4404	0611079A12	2.7 ohms, +/-5%; 1/10 W
R4406	0611079A36	27 ohms, +/-5%; 1/10 W
R4407	0611079A60	270 ohms, +/-5%; 1/10 W
R4409	0611072A41	470 ohms, +/-5%; 1/4 W
R4410	0611077A57	200 ohms, +/-5%; 1/8 W
R4411	0611079A55	RES FIXED CHIP 160 5 1/10W A/P
R4501	0662057A83	CHIP RES 27K OHMS 5%
R4502	0662057A89	CHIP RES 47K OHMS 5%
R4503	0611079G30	RES CHIP 20.0K 1/10W 1% 0805
R4505	0611079G31	RES CHIP 20.5K 1/10W 1% 0805
R4507,4508	0662057A73	CHIP RES 10K OHMS 5%
R4509	0611079F74	RES CHIP 5.76K 1/10W 1% 0805
R4510	0662057A89	CHIP RES 47K OHMS 5%
R4511	0662057A53	CHIP RES 1500 OHMS 5%
R4512	0611079F74	RES CHIP 5.76K 1/10W 1% 0805
R4513	0662057A97	CHIP RES 100K OHMS 5%
R4514	0662057A57	CHIP RES 2200 OHMS 5%
R4515	0662057A89	CHIP RES 47K OHMS 5%
R4516,4517	0662057A97	CHIP RES 100K OHMS 5%
R4518	0662057A73	CHIP RES 10K OHMS 5%
R4522	0662057A73	CHIP RES 10K OHMS 5%
R4523	0662057A77	CHIP RES 15K OHMS 5%
R4524	0682089V01	SMT .01 2W
R4525	0662057A75	CHIP RES 12K OHMS 5%
R4526	0662057A73	CHIP RES 10K OHMS 5%
R4530	0662057A49	CHIP RES 1000 OHMS 5%
R4532	0611077A74	1K, +/-5%; 1/8 W
R4535	0662057A83	CHIP RES 27K OHMS 5%
R4537	0662057A83	CHIP RES 27K OHMS 5%
R4538	0662057A57	CHIP RES 2200 OHMS 5%
R4539	0662057A53	CHIP RES 1500 OHMS 5%
R4540	0662057A49	CHIP RES 1000 OHMS 5%
R4541	0662057A57	CHIP RES 2200 OHMS 5%
R4542	0611079G49	31.6K, 1/10W; +/-1%
R4543	0662057A57	CHIP RES 2200 OHMS 5%
R4544	0611079F74	RES CHIP 5.76K 1/10W 1% 0805
R4545	0662057A49	CHIP RES 1000 OHMS 5%
R4546	0662057A57	CHIP RES 2200 OHMS 5%
R4547	0662057A49	CHIP RES 1000 OHMS 5%
R4548 thru 4550	0662057A73	CHIP RES 10K OHMS 5%
R4551	0662057A49	CHIP RES 1000 OHMS 5%
R4552,4553	0683962T24	9.1 ohms, +/-5%; 1 W
R4554,4555	0662057A89	CHIP RES 47K OHMS 5%
R4556,4557	0662057A57	CHIP RES 2200 OHMS 5%
R4559	0662057A49	CHIP RES 1000 OHMS 5%
R4560	0662057A53	CHIP RES 1500 OHMS 5%
R4562	0662057A49	CHIP RES 1000 OHMS 5%
R4563	0682089V01	SMT .01 2W
R4564	0662057A53	CHIP RES 1500 OHMS 5%
R4565	0662057B47	CHIP RES 0 OHMS +/- .050 OHMS
R4566,4567	0662057A49	CHIP RES 1000 OHMS 5%
R4568 thru 4571	0662057B47	CHIP RES 0 OHMS +/- .050 OHMS
R4577,4578	0662057A97	CHIP RES 100K OHMS 5%

THERMISTOR:

RT4501 0680149M02 100 k, +/-10%; 240 mW

TTX1020A 100 W PA Module (435 to 470MHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
INTEGRATED CIRCUIT: (SEE NOTE)		
U4504	5113816A07	5-Volt Positive Regulator
U4505	5113819A04	Quad Operational Amplifier
U4506	5113811A08	IC; 8-bit
U4507	5180057S02	IC CMOS CUST DA CONV 13" REEL
U4508	5113819A04	Quad Operational Amplifier
CABLE ASSEMBLY:		
W4000 thru 4007	4282981X01	STRAP PA BRAIDED
W4200 thru 4207	2982412V01	TRANSISTOR LEAD
W4208 thru 4217	4282981X01	STRAP PA BRAIDED
W4222	4282981X01	STRAP PA BRAIDED
W4900	4282981X01	STRAP PA BRAIDED
NON-REFERENCED ITEMS		
	THN6786A	MODULE HOUSING PA HIGH POWER
	TLE9150A	UHF OMNI MODULE R1 & R2
	TTE6322A	R2 UHF DDM
	TTE6332A	R2 UHF LPF/COUPLER
	TTE6392A	PA,UHF,100W,OUTPUT BD,R2
	TTE6400A	PA,UHF,100W,INPUT BD
	TTN5238A	CIRCULATOR LOAD
	0310907A40	SCRMCH(M4X0.7X25) STRPANSTLCAD (8 used)
	0310907C66	SCRMCH M4X0.7X45MM STLCAD (4 used)
	0310917A51	SCRMCH M3.5X0.6X12 STPN STLZNC (3 used)
	0312016A03	SCRTPG TT3X0.5X8 STARPAN (26 used)
	0782106V01	BRACKET; low pass filter
	0900816159	CONNECTOR, receptacle: coaxial
	1383852R01	GRILLE, fan
	1582626X01	COVER PA & PS CAST
	2182805H05	1000 pF, +/-0%; 200V (2 used)
	2682624X01	HEATSINK HP PWR AMPLCASTING
	3082728X05	CBL 6-WIRE
	3282170V01	GASKET RF (56 used)
	4382314W02	FLANGE 280MHZ DDM
	4385035U02	FLANGE circulator load (VHF)
	5482006W01	Label, PCB barcode
	5483323X01	LABEL, FREQ. REF.
	5484960T01	Label, barcode: 6.3 x 12.7mm, white (2 used)
	5884911T04	CIRCULATOR
	5983663R09	FAN DC 1" THK X120MMX120MM
	6482474V01	PLATE

Note: For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

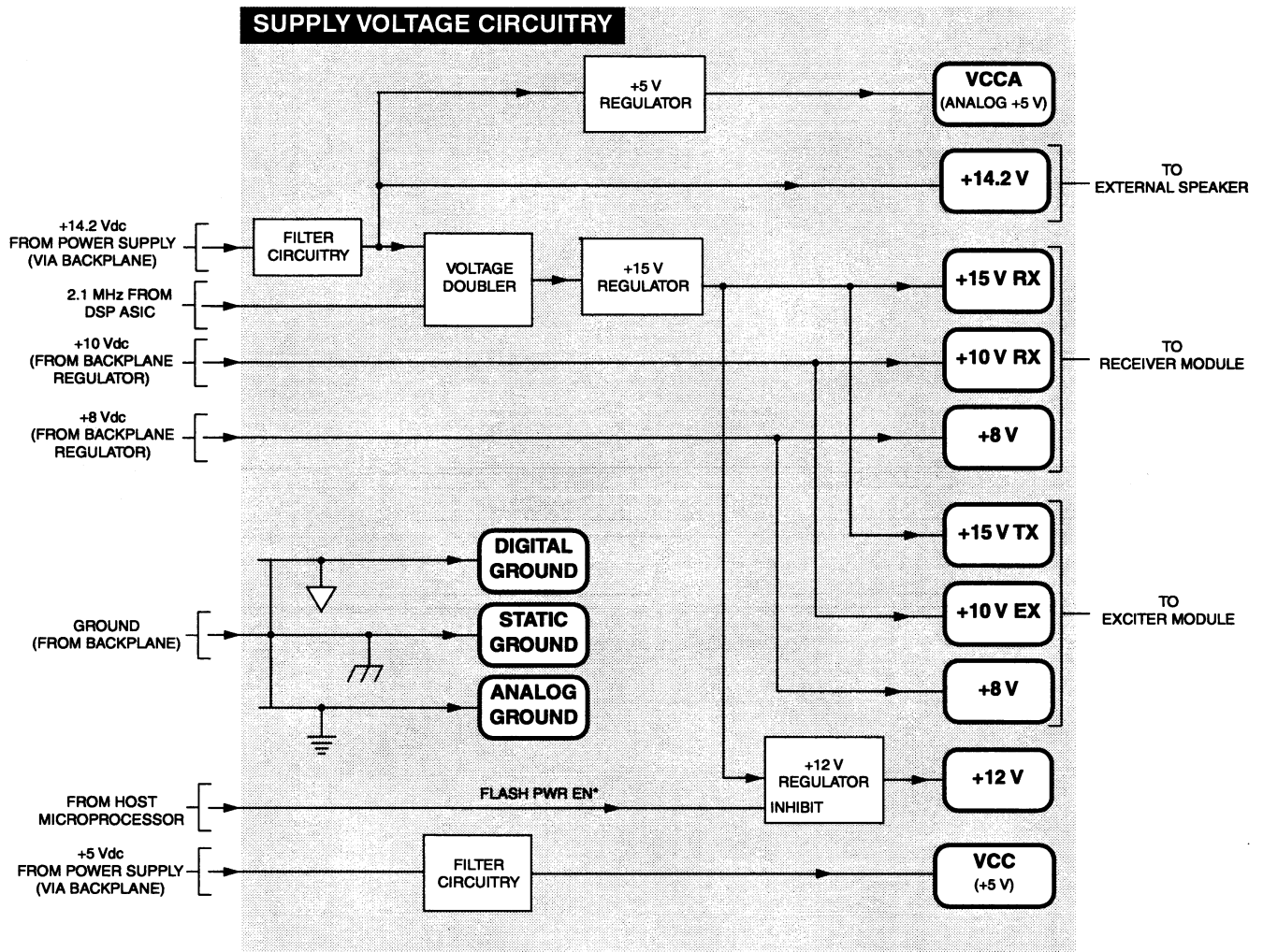
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Parts List (Sheet 12 of 12)

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STATION CONTROL MODULES

MODEL TCN6273C



STATION CONTROL MODULE FUNCTIONAL BLOCK DIAGRAM

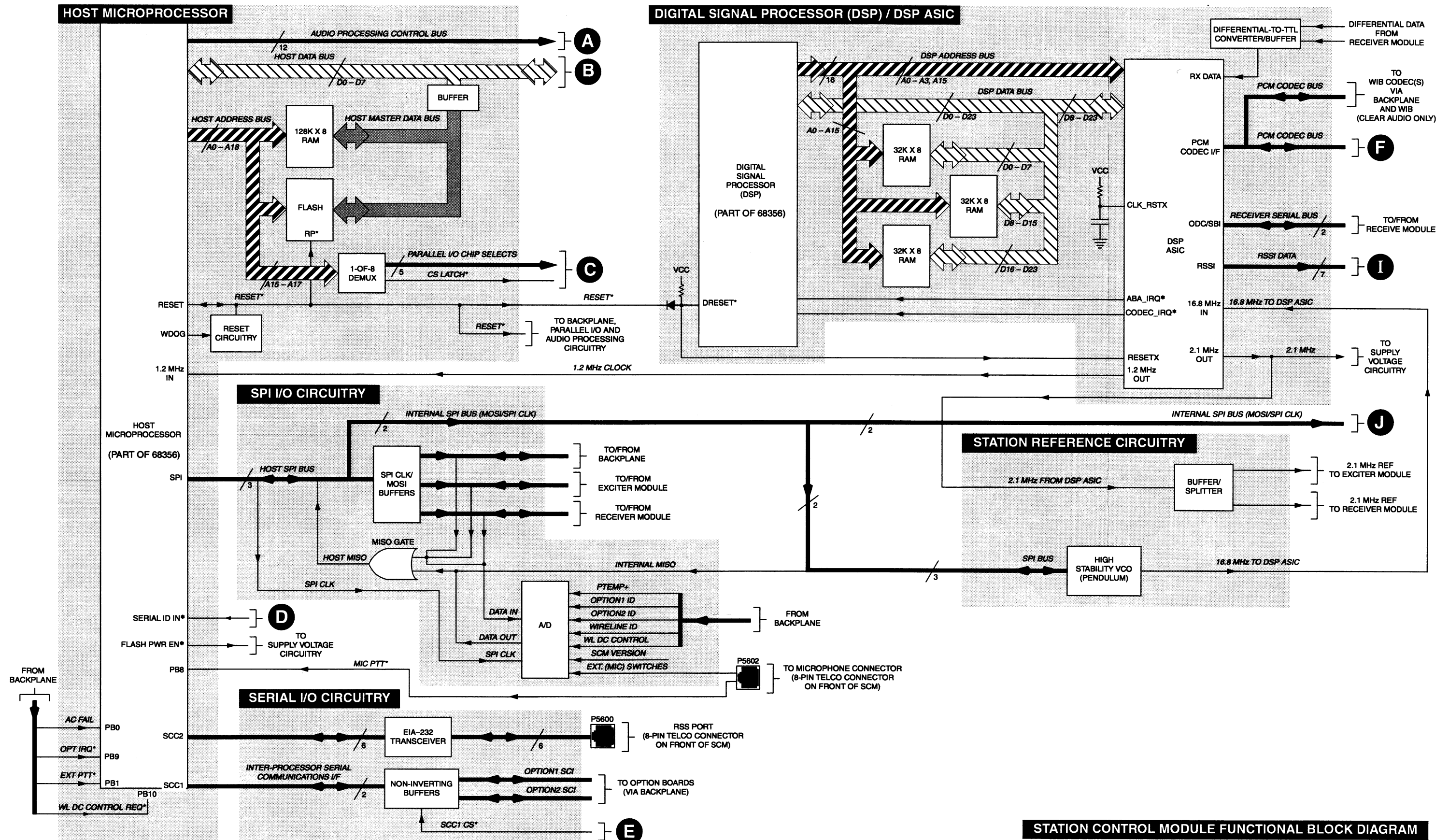
STATION CONTROL MODULES

MODEL TCN6273C

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STATION CONTROL MODULES

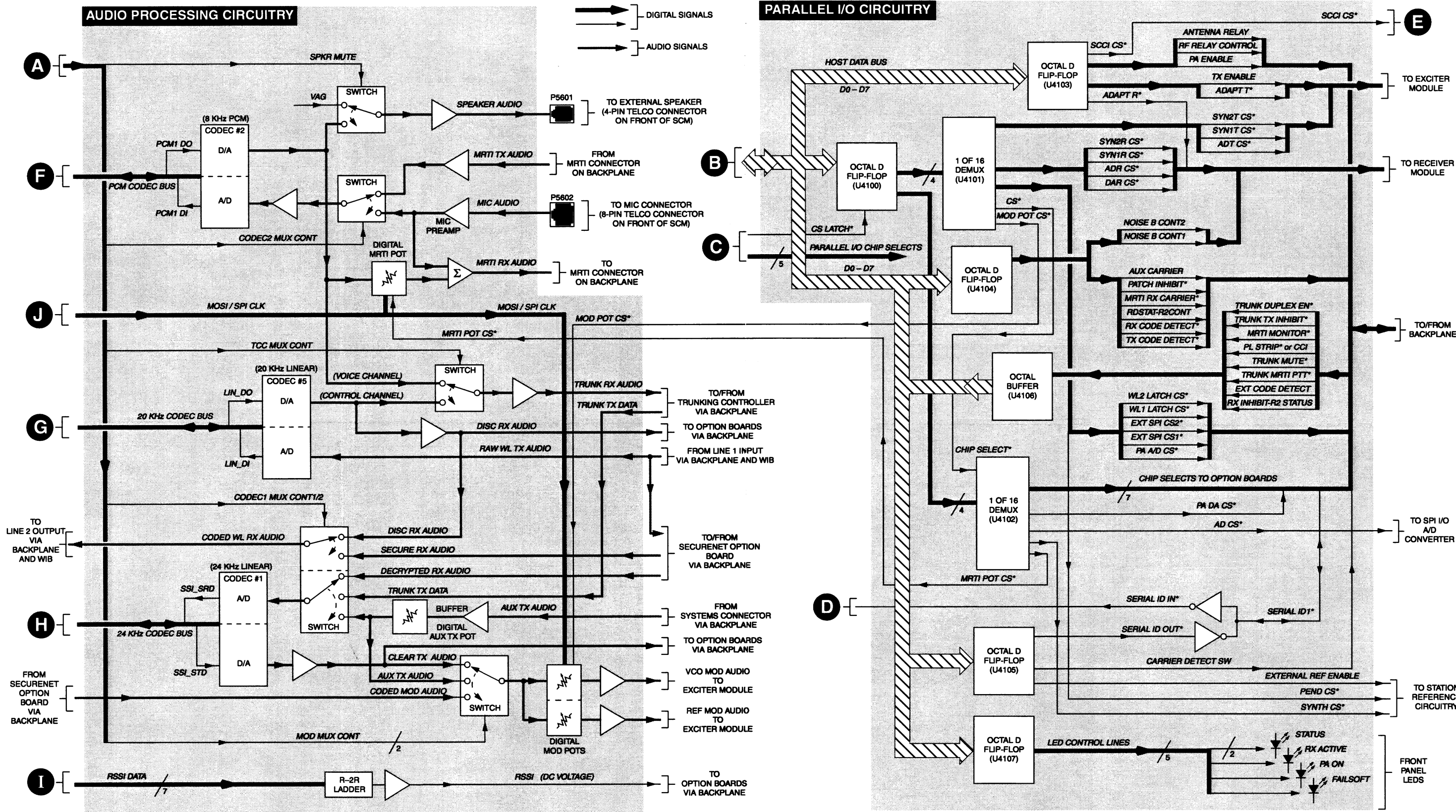
MODEL TCN6273C



STATION CONTROL MODULE FUNCTIONAL BLOCK DIAGRAM

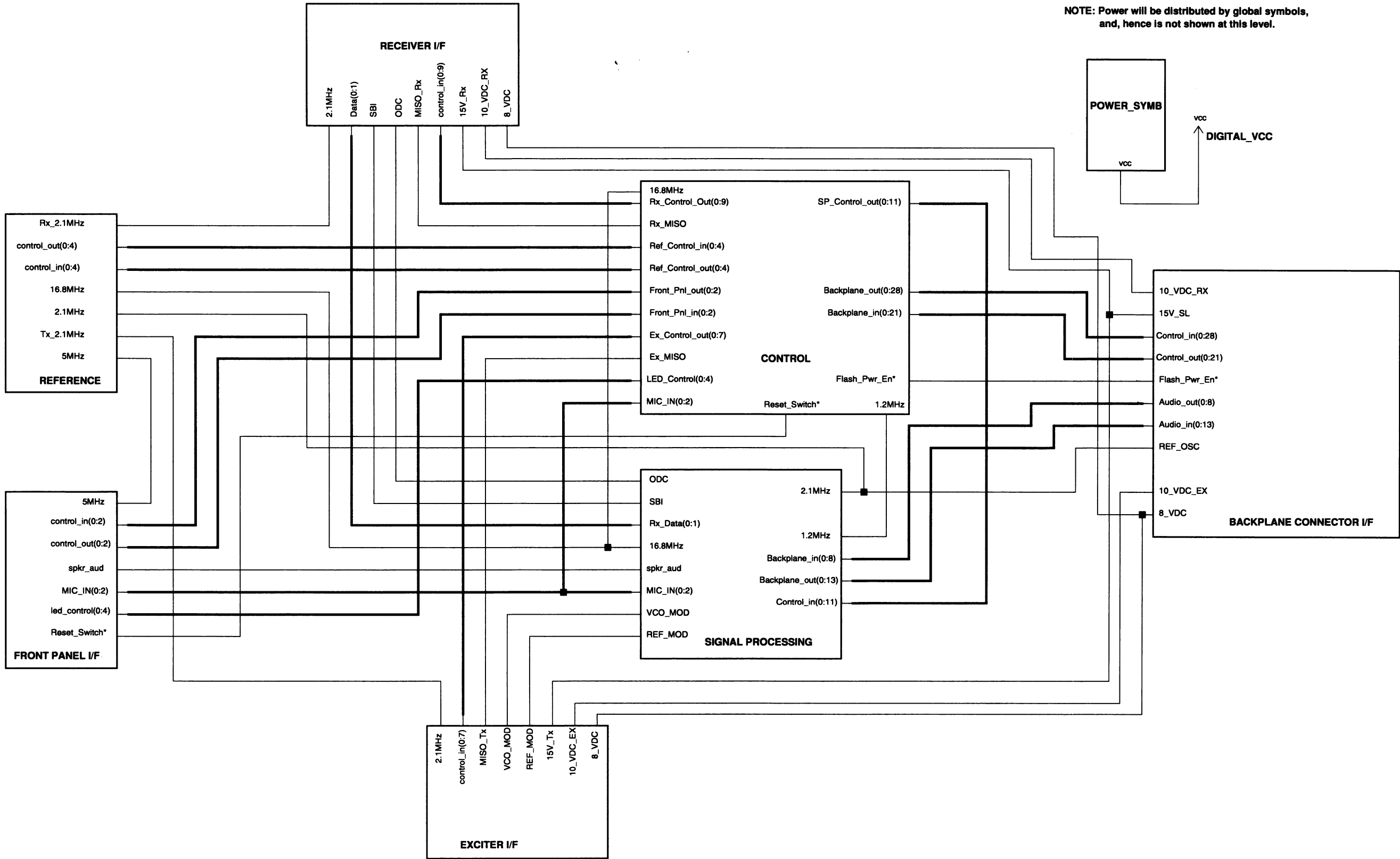
STATION CONTROL MODULES

MODEL TCN6273C



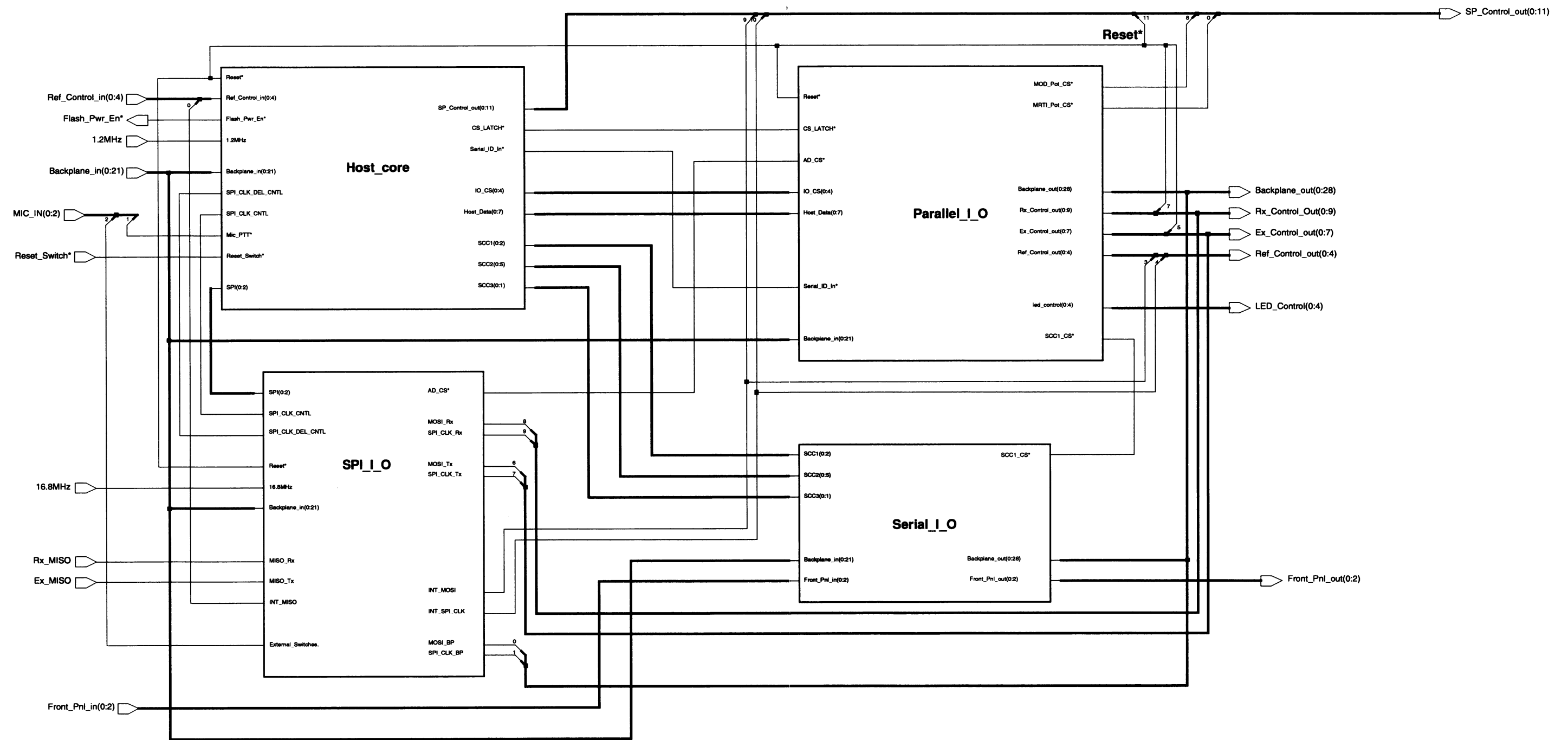
STATION CONTROL MODULE FUNCTIONAL BLOCK DIAGRAM

STATION CONTROL MODULES
MODEL TCN6273C



SCM TOP LEVEL BLOCK DIAGRAM

STATION CONTROL MODULES
MODEL TCN6273C



SCM CONTROL CIRCUITS BLOCK DIAGRAM

STATION CONTROL MODULES
MODEL TCN6273C

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STATION CONTROL MODULES

MODEL TCN6273C

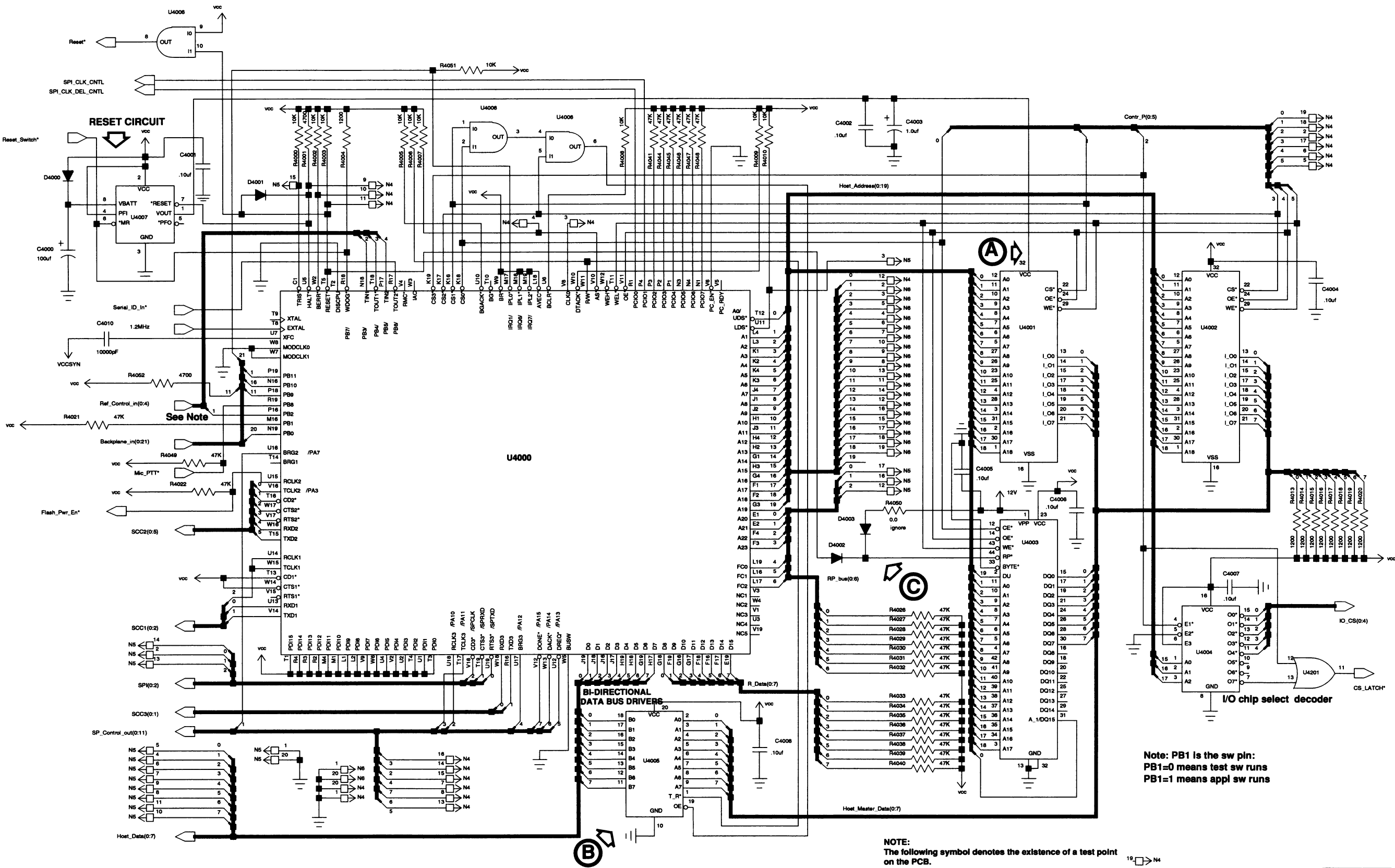
SERVICE NOTES-HOST CORE

Signal Path	Description/Nominal Signal Levels
Ⓐ	VCC pin connected to the Battery Backup pin of U4007, to preserve the RAM content in case of power failure.
Ⓑ	Host Data Bus is split in 2 by the U4005 buffer: Host_Master_Data bus connects the memory devices and Host_Data bus connects the rest of the IC's (I/O's) on this data bus.
Ⓒ	While in Read mode, R4050 is not placed and the RP pin on the flash IC (U4003) is tied to the Reset pin on the processor via D4002, and the boot block is locked. When the Boot Block needs to be programmed (Write mode), R4050 is soldered in and the RP pin is tied to 12V via D4003 and R4050.

SCHEMATIC IC'S TABLE-HOST CORE

Reference	Type	Description
U4000	MC68356	Signal Processing Communication Engine
U4001,2	HM628128	CMOS Static RAM, 128 * 8 byte
U4003	TB28F400	256*16 Boot Block Flash Memory
U4004	MC74AC138	1 of 8 Decoder/Demultiplexer
U4005	MC74AC245	Octal Bidirectional Transceiver With 3-State I/O
U4006...	MC74AC08	Quad 2 input AND Gate
U4007	MAX703	uP Supervisory Circuit with Battery Backup
U4201...	MC74AC32	Quad 2-input OR gate

STATION CONTROL MODULES
MODEL TCN6273C



NOTE:
The following symbol denotes the existence of a test point
on the PCB.

Note: PB1 is the sw pin:
PB1=0 means test sw runs
PB1=1 means appli sw runs

HOST CORE

STATION CONTROL MODULES
MODEL TCN6273C

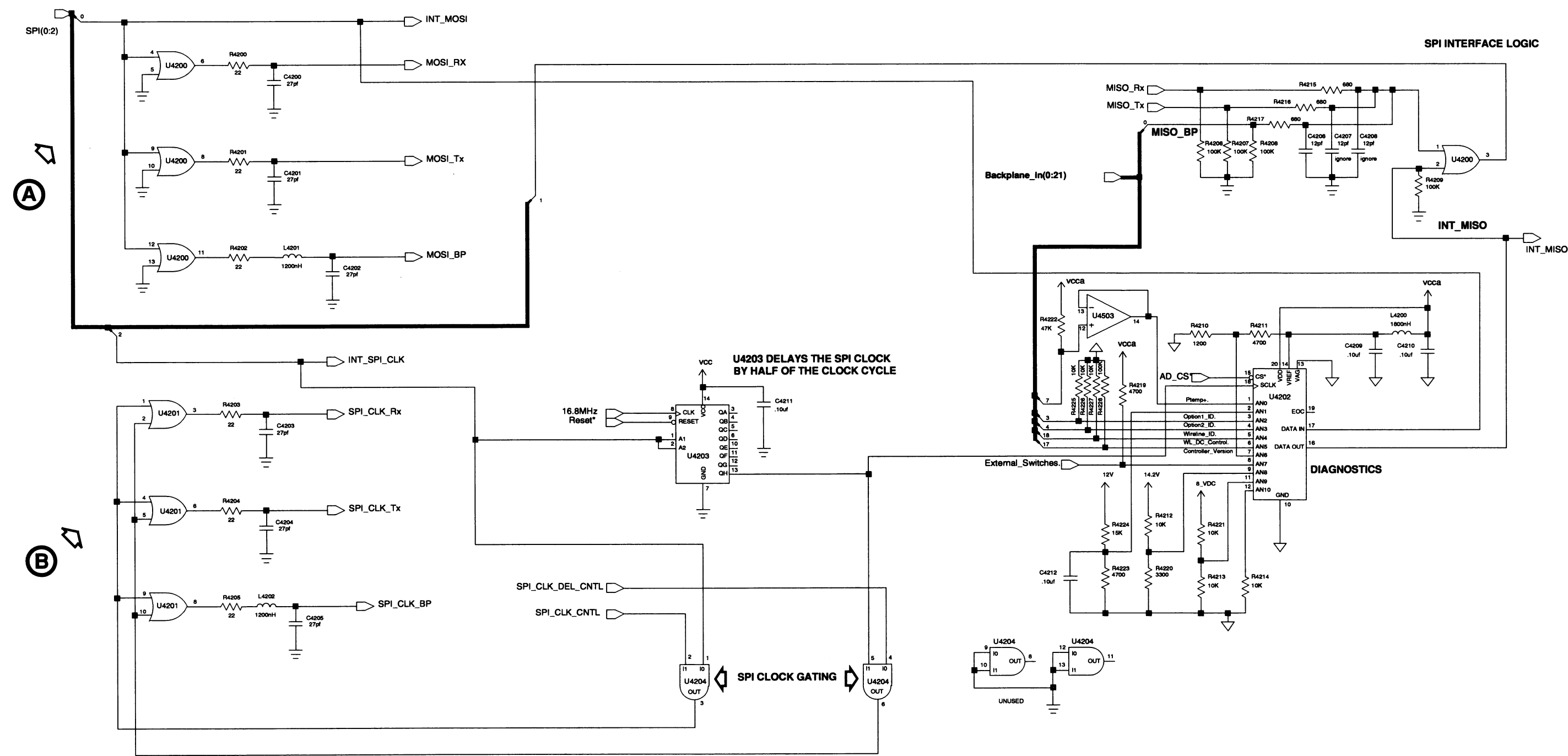
SERVICE NOTES-SPI I/O

Signal Path	Description/Nominal Signal Levels
Ⓐ Ⓑ	SPI bus is buffered as it goes to the receiver, exciter and back plane to avoid interference and reduce capacitance loading.

SCHEMATIC IC'S TABLE-SPI I/O

Reference	Type	Description
U4201...	MC74AC32	Quad 2-input OR gate
U4203	MC74HC164	8 Bit Serial Input/Parallel Output Shift Register
U4503...	MC33074	Quad, High Performance Single Supply Op Amp

STATION CONTROL MODULES
MODEL TCN6273C



SPI INPUT OUTPUT

STATION CONTROL MODULES

MODEL TCN6273C

PARALLEL I/O'S TABLE

Reference	Description	Memory Address	Data Value
U4101-16	PA_AD_CS*	CS3 +\$38000	\$XE
U4101-15	Ext_SPI_CS1*	CS3 +\$38000	\$XD
U4101-14	Ext_SPI_CS2*	CS3 +\$38000	\$XC
U4101-13	WL_Latch1_CS*	CS3 +\$38000	\$XB
U4101-11	WL_Latch2_CS*	CS3 +\$38000	\$XA
U4101-10	Pend_CS*	CS3 +\$38000	\$X9
U4101-9	(spare)	CS3 +\$38000	\$X8
U4101-8	Mod_Pot_CS	CS3 +\$38000	\$X7
U4101-7	DAR_CS*	CS3 +\$38000	\$X6
U4101-6	ADR_CS*	CS3 +\$38000	\$X5
U4101-5	SYN1R_CS*	CS3 +\$38000	\$X4
U4101-4	SYN2R_CS*	CS3 +\$38000	\$X3
U4101-3	ADT_CS*	CS3 +\$38000	\$X2
U4101-2	SYN1T_CS*	CS3 +\$38000	\$X1
U4101-1	SYN2T_CS*	CS3 +\$38000	\$X0
U4102-17	(spare)	CS3+\$38000	\$FF
U4102-16	(spare)	CS3+\$38000	\$EF
U4102-15	(spare)	CS3+\$38000	\$DF
U4102-14	(spare)	CS3+\$38000	\$CF
U4102-13	(spare)	CS3+\$38000	\$BF
U4102-11	Synth_CS*	CS3+\$38000	\$AF
U4102-10	A/D_CS*	CS3+\$38000	\$9F
U4102-9	SPKR_Pot_CS	CS3+\$38000	\$8F
U4102-8	PA_DA_CS*	CS3+\$38000	\$7F
U4102-7	OP1_CS1*	CS3+\$38000	\$6F
U4102-6	OP1_CS2*	CS3+\$38000	\$5F
U4102-5	OP1_CS3*	CS3+\$38000	\$4F
U4102-4	OP1_CS4*	CS3+\$38000	\$3F
U4102-3	OP2_CS1*	CS3+\$38000	\$2F
U4102-2	OP2_CS2*	CS3+\$38000	\$1F
U4102-1	OP2_CS3*	CS3+\$38000	\$0F
U4103-19	ADAPT_R*	CS3+\$00000	\$80
U4103-16	ADAPT_T*	CS3+\$00000	\$40
U4103-15	TX_ENABLE	CS3+\$00000	\$20
U4103-12	SCC1_CS*	CS3+\$00000	\$10
U4103-9		CS3+\$00000	\$8
U4103-6	PA_ENABLE	CS3+\$00000	\$4
U4103-5	RF_Relay_Cntrl	CS3+\$00000	\$2
U4103-2	Ant_Relay	CS3+\$00000	\$1
U4104-19	NOISE_B_CONT1	CS3+\$08000	\$80
U4104-16	NOISE_B_CONT2	CS3+\$08000	\$40
U4104-15	Tx_Code_Det	CS3+\$08000	\$20
U4104-12	Rx_Code_Det	CS3+\$08000	\$10
U4104-9	Rdstat	CS3+\$08000	\$8
U4104-6	MRTI_Rx_Carrier*	CS3+\$08000	\$4
U4104-5	Patch_Inhibit_or_RSTAT*	CS3+\$08000	\$2
U4104-2	Aux_carrier_or_TSTAT*	CS3+\$08000	\$1

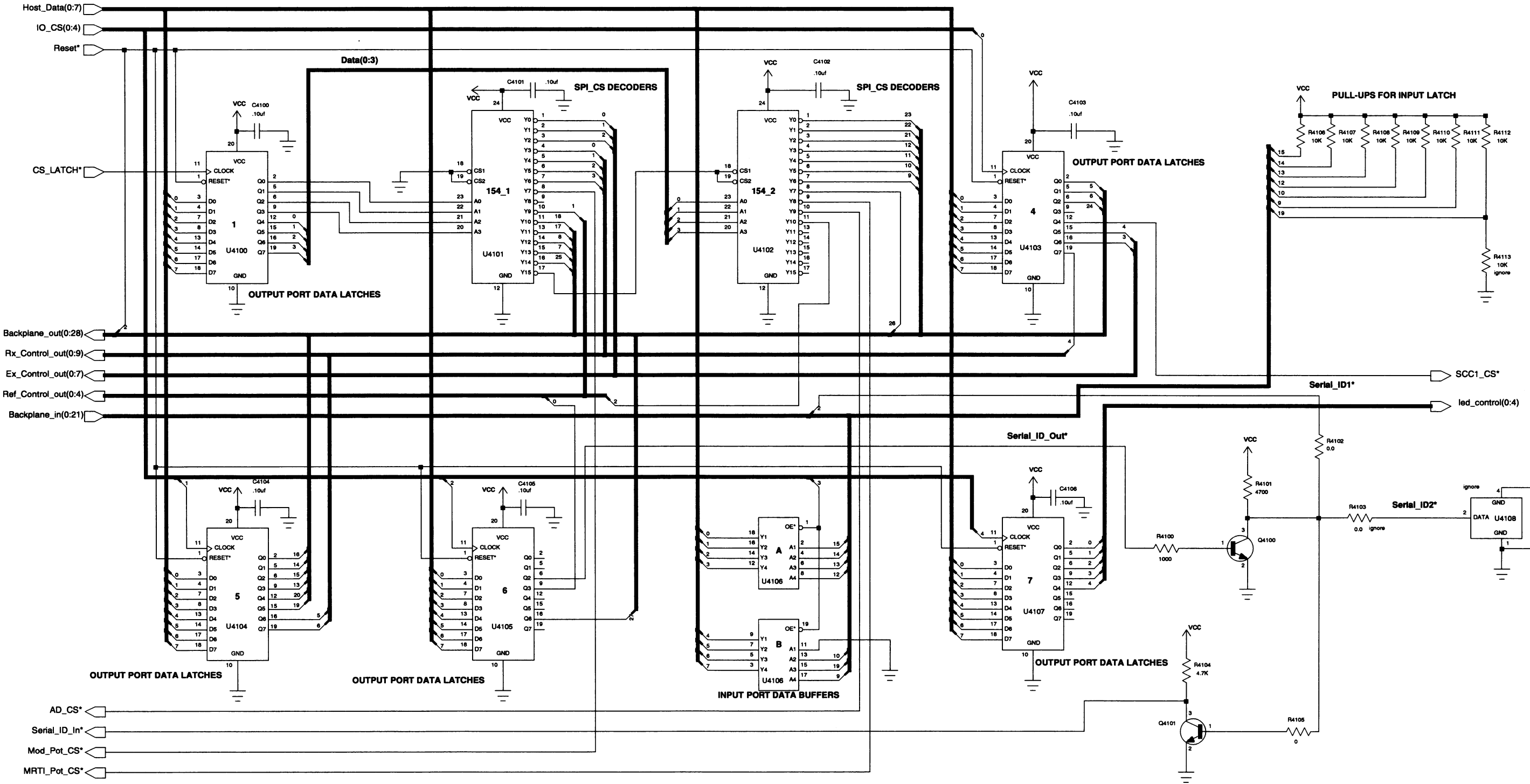
PARALLEL I/O'S TABLE (continued)

Reference	Description	Memory Address	Data Value
U4105-19	(spare)	CS3 +\$10000	\$80
U4105-16	Carrier_Detect_Switch	CS3 +\$10000	\$40
U4105-15	(spare)	CS3 +\$10000	\$20
U4105-12	(spare)	CS3 +\$10000	\$10
U4105-9	Ext_Ref_En	CS3 +\$10000	\$8
U4105-6	Serial_ID_Out*	CS3 +\$10000	\$4
U4105-5		CS3 +\$10000	\$2
U4105-2	(spare)	CS3 +\$10000	\$1
U4107-2	LED cntl (failsoft*)	CS3 +\$20000	\$1
U4107-5	LED cntl (rx_act*)	CS3 +\$20000	\$2
U4107-6	LED cntl (pa_on*)	CS3 +\$20000	\$4
U4107-9	LED cntl (strn_stat_bicolor1*)	CS3 +\$20000	\$8
U4107-12	LED cntl (strn_stat_bicolor2*)	CS3 +\$20000	\$10
U4107-15	(spare)	CS3 +\$20000	\$20
U4107-16	(spare)	CS3 +\$20000	\$40
U4107-19	(spare)	CS3 +\$20000	\$80
U4000-V12	Mod_Mux_Cont1		
U4000-W13	Mod_Mux_Cont2		
U4000-U12	Codec1_Mux_Cont1		
U4000-U17	Codec1_Mux_Cont2		
U4000-T17	TCC_Mux_Cont		
U4000-U18	Codec2_Mux_Cont		
U4000-U16	Spkr_Mute		
U4000-U15	Flash_Pwr_En*		
U4106-17	R2_Status	CS3 +\$18000	
U4106-15	Ext_Code_Det	CS3 +\$18000	
U4106-13	Trkg/MRTI_PTT*	CS3 +\$18000	
U4106-11	not used	CS3 +\$18000	
U4106-8	PL_Strip_or_CCI*	CS3 +\$18000	
U4106-6	MRTI_Monitor*	CS3 +\$18000	
U4106-4	Trunk_Tx_Inhibit*	CS3 +\$18000	
U4106-2	Trunk_Duplex_Enable*	CS3 +\$18000	
U4000-M17	Opt_IRQ*		
U4000_P4	SPI_CLK_CNTRL		
U4000_R1	SPI_CLK_DEL_CNTRL		
U4000-P19	Ext_PTT*		
U4000-N16	WL_DC_Control_REQ*		
U4000-P18	TRUNK_MUTE*		
U4000-R19	Mic_PTT*		
U4000-R17	Serial_ID_In*		
U4000-P17	Lock		
U4000-T18	5MHz_Act		
U4000-N18	16.8MHz_Act		
U4000-P16	Pend_Freq_Low		
U4000-M16	Software indicator		
U4000-N19	AC_FAIL		

SCHEMATIC IC'S TABLE-PARALLEL I/O

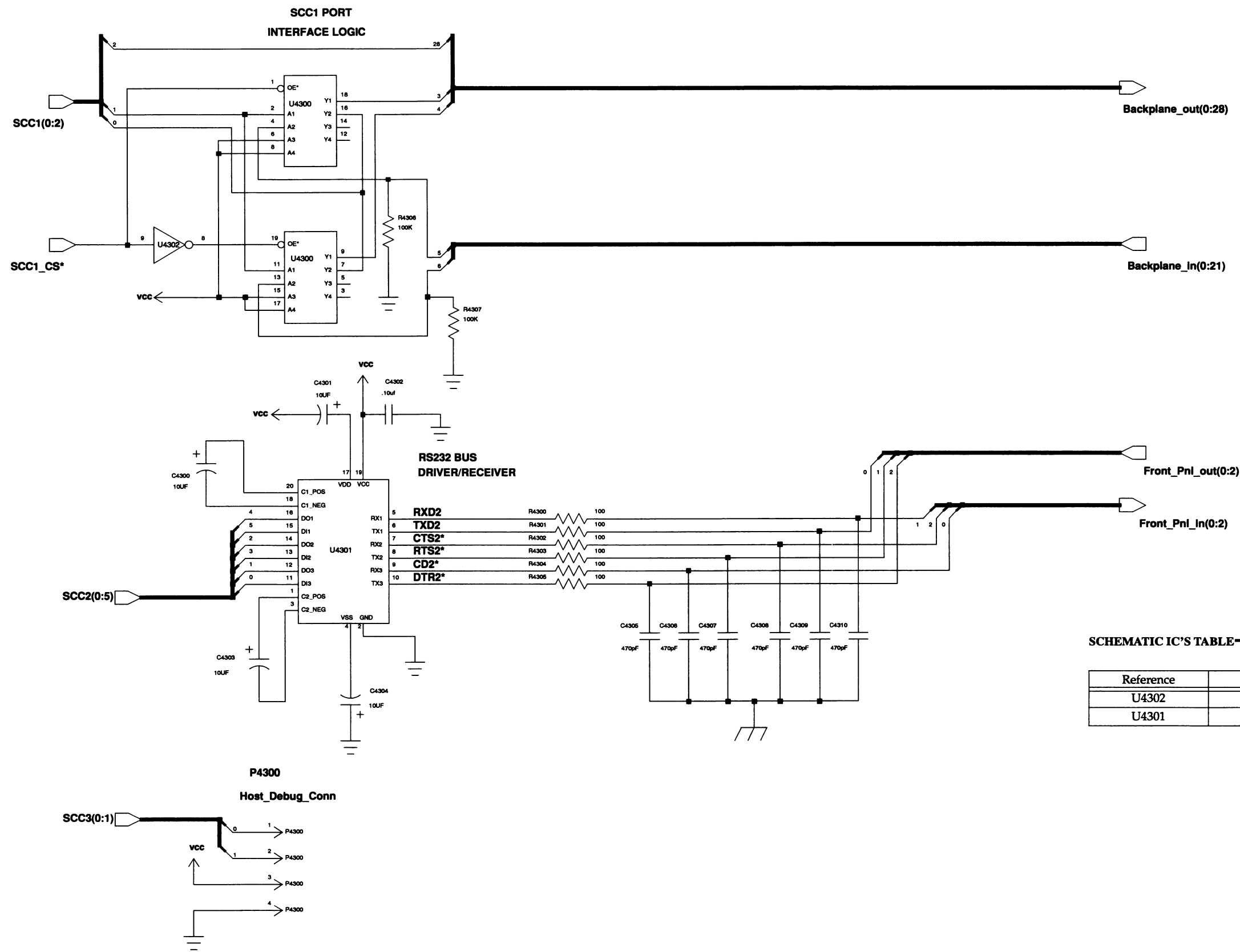
Reference	Type	Description
U4100...	MC74HC273	Octal D Flip-Flop with Common Clock and Reset
U4101...	MC74HC154	1 of 16 Dcoder/Demultiplexer
U4106...	MC74HC244	Octal 3 State Noninverting Buffer/Line Driver/Line Receiver
U4108	DS2400	Silicon Serial Number

STATION CONTROL MODULES
MODEL TCN6273C



PARALLEL INPUT OUTPUT

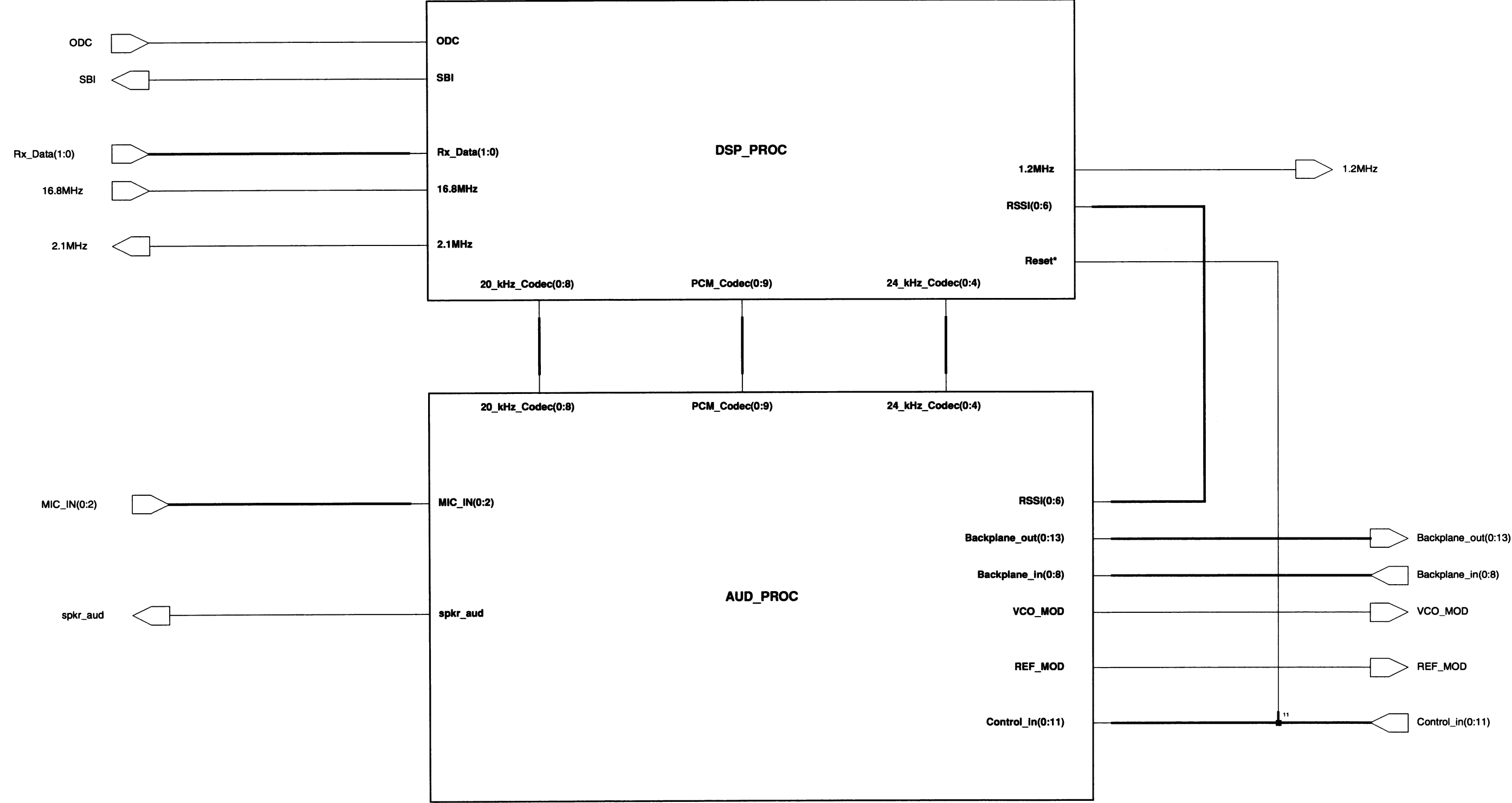
STATION CONTROL MODULES
MODEL TCN6273C



SCHEMATIC IC'S TABLE-SERIAL I/O

Reference	Type	Description
U4302	Mc74AC04	Hex Inverter
U4301	MC145407	EIA-232/V28 5V only Driver Receiver (3*3)

SERIAL INPUT OUTPUT



SIGNAL PROCESSING CIRCUITS BLOCK DIAGRAM

STATION CONTROL MODULES

MODEL TCN6273C

SERVICE NOTES-DSP PROCESSING

Signal Path	Description/Nominal Signal Levels
Ⓐ	Abacus Current-to-Voltage and Differential to Single-ended converter. Q4400 and Q4401 take the current output from the Abacus chip on the receiver board and converts it to a voltage. Then the two halves of the differential input are converted to a single output by Q4402. Finally, Q4403 outputs a full scale 0-5V bit stream representing the Abacus output.
Ⓑ	Reset. Generated in the host core. Used here to reset the 56002 and U4400 (glue ASIC) and to configure the IRQ lines properly for system reset
Ⓒ	OGA. Outlaw Glue ASIC. Provides an interface to 4 PCM codecs and 1 linear codec. Receives the Abacus data stream. Provides RSSI output. Divides 16.8 MHz clock to provide both 1.2 MHz and 2.1 MHz clocks.
Ⓓ	P4400. OnCE port for DSP emulation.
Ⓔ	U4400. 56002 half or the 68356 device. Does all DSP. Has dedicated memory (U4401-U4403).

SCHEMATIC IC'S TABLE-DSP PROCESSING

Reference	Type	Description
U4400	Custom IC	Asic
U4401...	MT5C2568	32k*8 SRAM

19. N4



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STATION CONTROL MODULES

MODEL TCN6273C

SERVICE NOTES -AUDIO PROCESSING

Signal Path	Description/Nominal Signal Levels
Ⓐ	VCO MOD. Transmit audio out to exciter.
Ⓑ	REF MOD. Transmit audio to modulate synthesizer reference signal. Same audio as VCO MOD but at a different level.
Ⓒ	RSSI. R-2R ladder, D/A converter. Converts 7-bit RSSI output of Outlaw Glue ASIC to a 0-5V voltage.
Ⓓ	Limiter. Limits the input to CODEC #2.
Ⓔ	There is no Rx audio path that can be monitored unless the Discriminator Rx Audio output is enabled. Rx audio comes in digitally from the Abacus chip and immediately enters the DSP processor (U4400/56002).
Ⓕ	EEPOT. Potentiometer adjusted over the SPI bus by the host processor.

SCHEMATIC IC'S TABLE-AUDIO PROCESSING

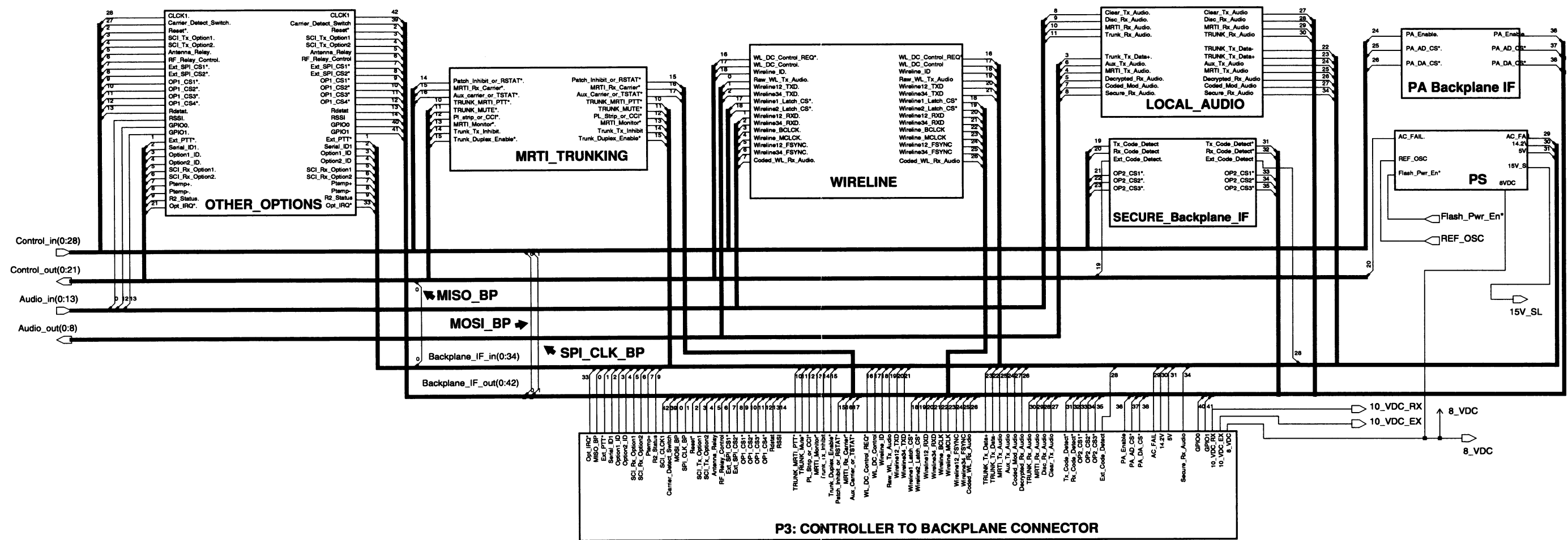
Reference	Type	Description
U4501	MC74AC74	Dual D-type Positive-Edge triggered Flip-Flop
U4502...	CSP1027	Linear Codec
U4503...	MC33074	Quad, High Performance Single Supply Op Amp
U4504...	MC145480	PCM Codec
U4506...	MC33074	Quad Opamp, Single Supply
U4507	MC74HC4052	Dual 4-Channel Analog Multiplexer/Demultiplexer
U4508...	DS1267-10	Dual Digital Potentiometer
U4509	MC33204	Rail to Rail Op amps
U4511...	MC74HC4053	Triple 2-Channel Analog Multiplexer/Demultiplexer
U4519...	MC33202	Dual Rail to Rail Op Amp

MODEL TCN6273C



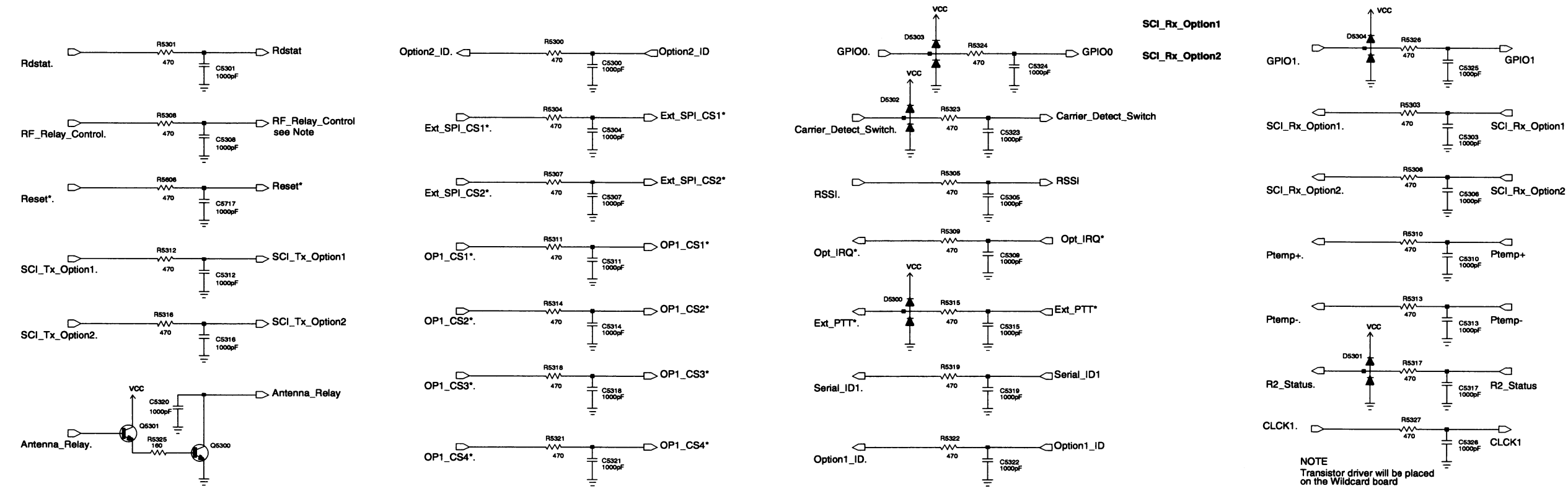
68P81094E31-B
Schematics (Sheet 19 of 36)
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STATION CONTROL MODULES
MODEL TCN6273C

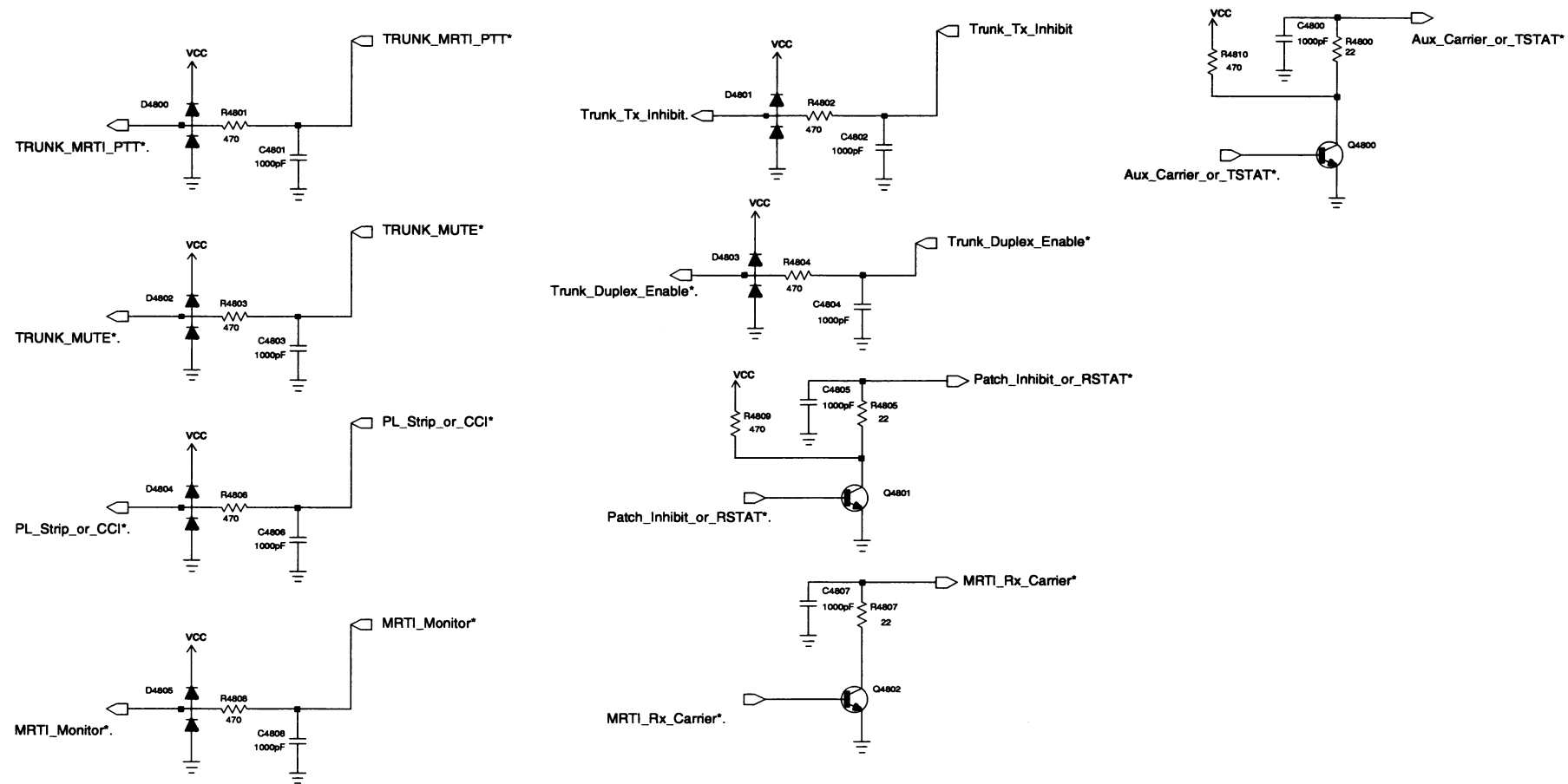


CONTROLLER TO BACKPLANE INTERFACE BLOCK DIAGRAM

STATION CONTROL MODULES
MODEL TCN6273C

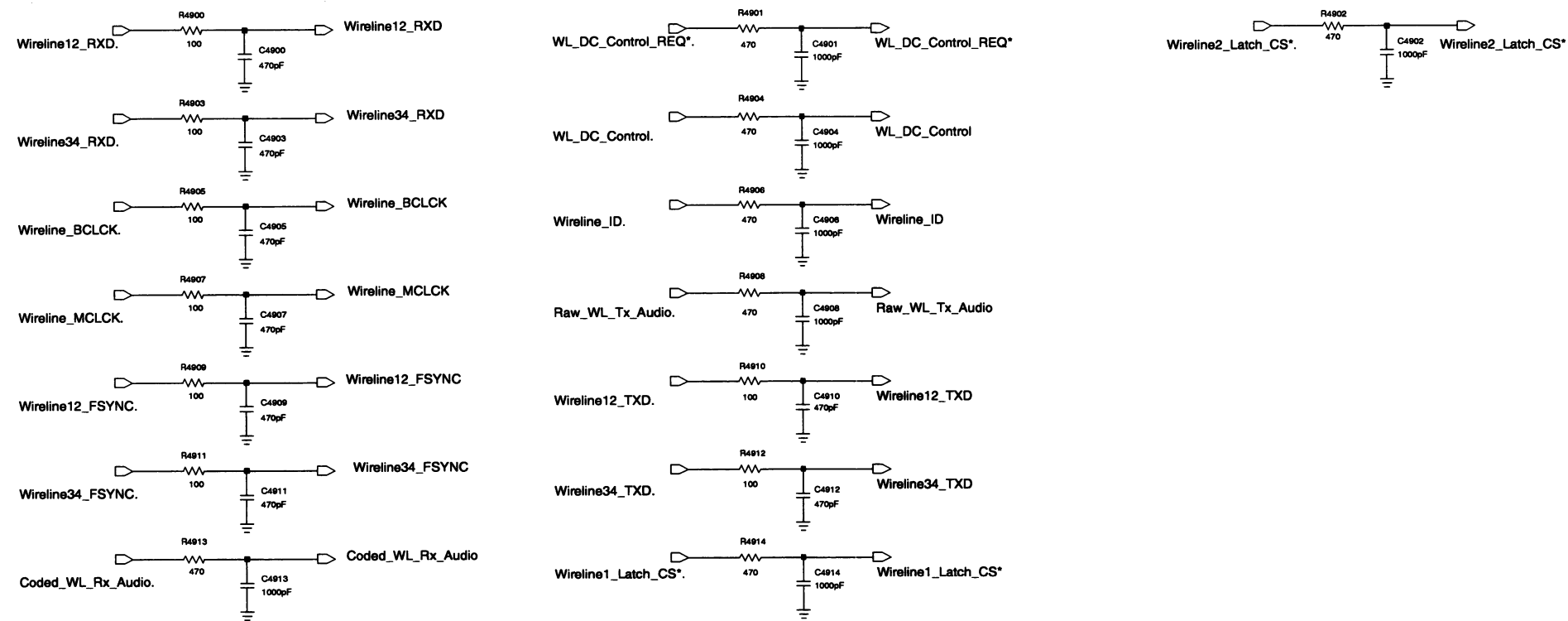


OTHER OPTIONS

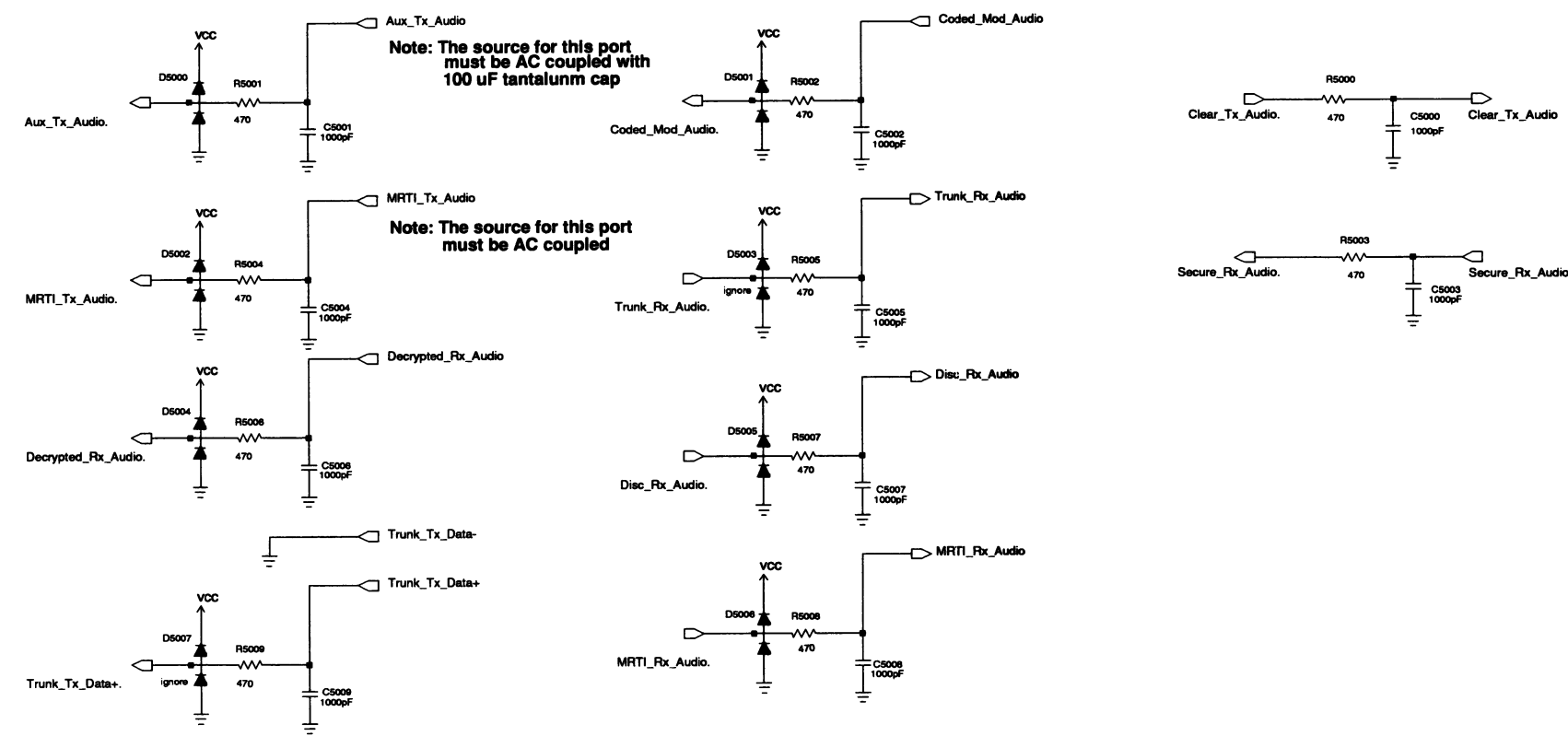


MRTI TRUNKING

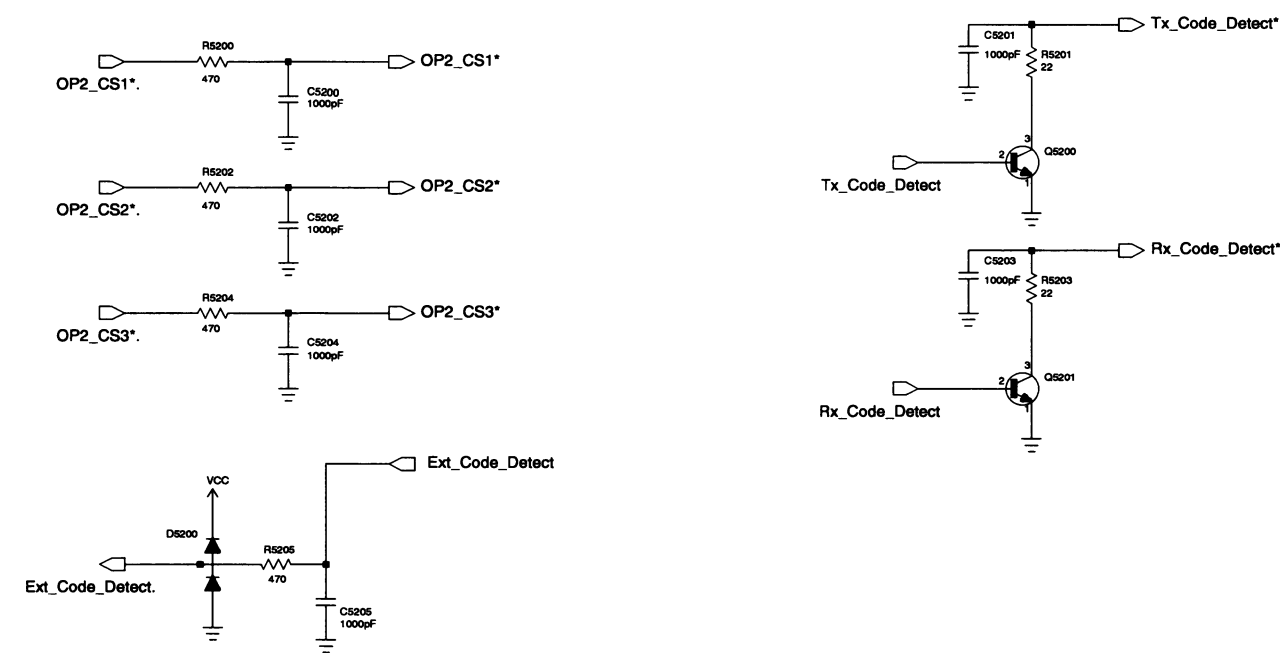
STATION CONTROL MODULES
MODEL TCN6273C



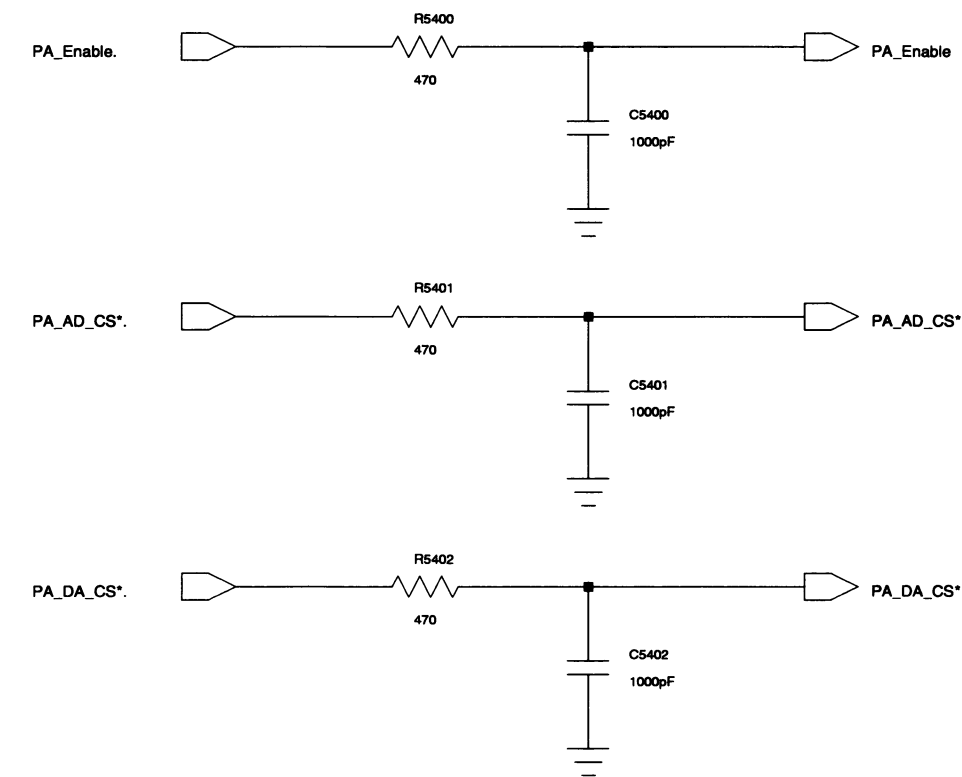
WIRELINE



LOCAL AUDIO

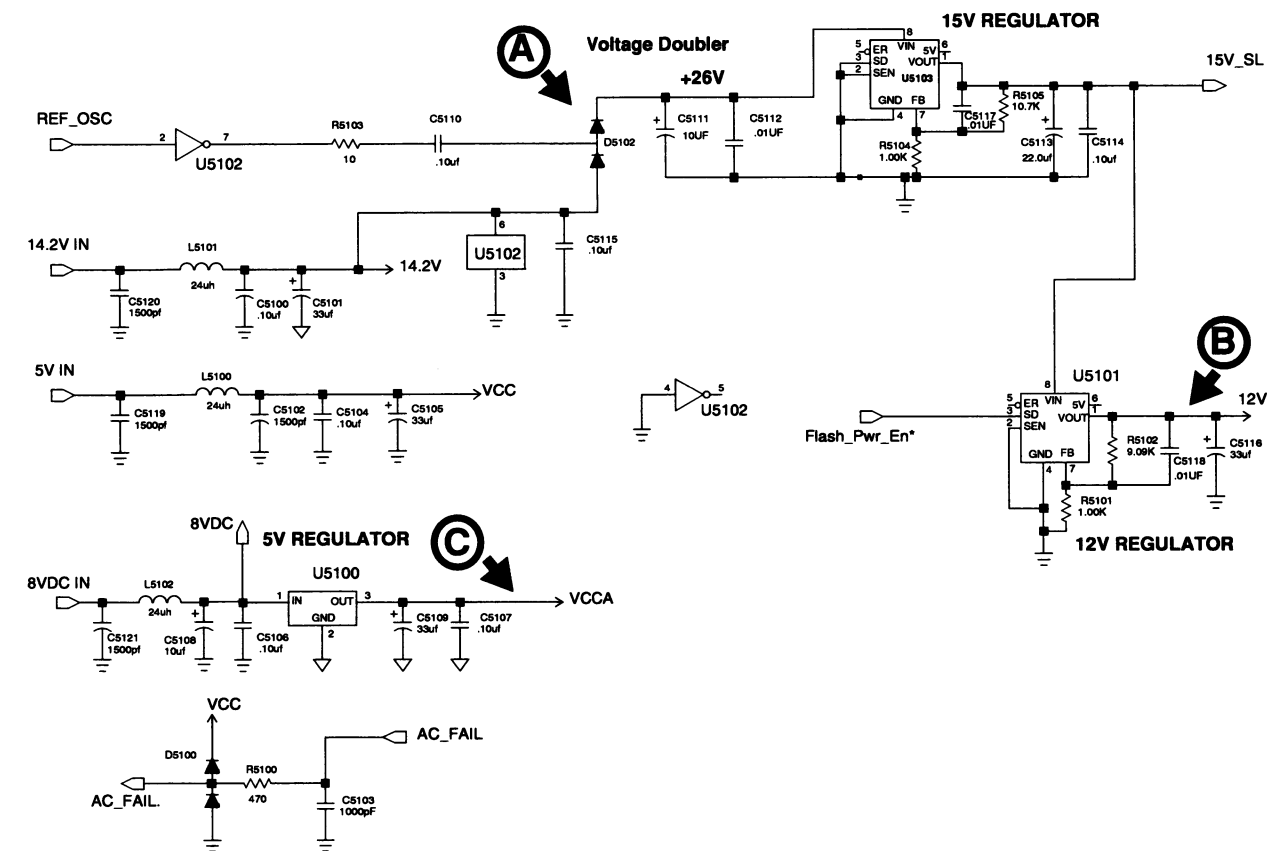


SECURENET INTERFACE



PA INTERFACE

STATION CONTROL MODULES
MODEL TCN6273C

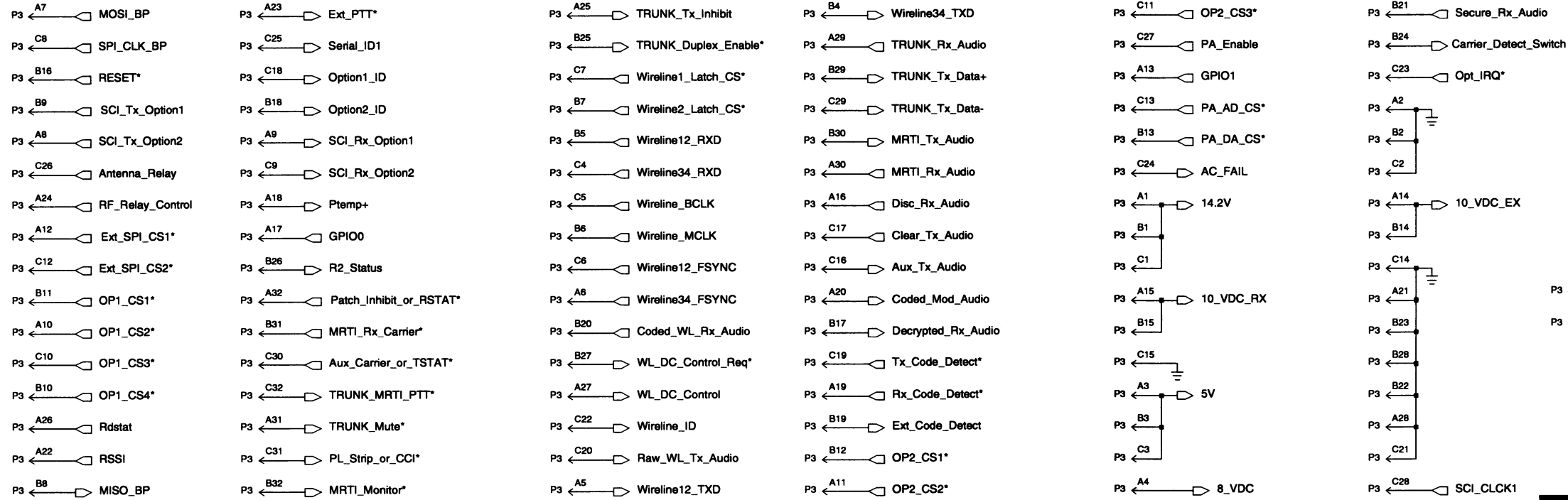


Signal Path	Description/Nominal Signal Levels
(A)	Voltage Doubler Circuit. Nearly doubles the 14.2V supply. This output is then regulated to provide the 15V steering line voltage for the receiver and exciter. Necessary for possible low input on the 14.2V line.
(B)	Flash Programming voltage regulator. A regulator that, when enabled by the software, provides 12V to allow programming of the Flash device.
(C)	Analog 5V regulator. Provides the 5V supply, vcca, for the analog portion of the Station Control Board (see Audio sheet).

SCHEMATIC IC'S TABLE-REGULATORS

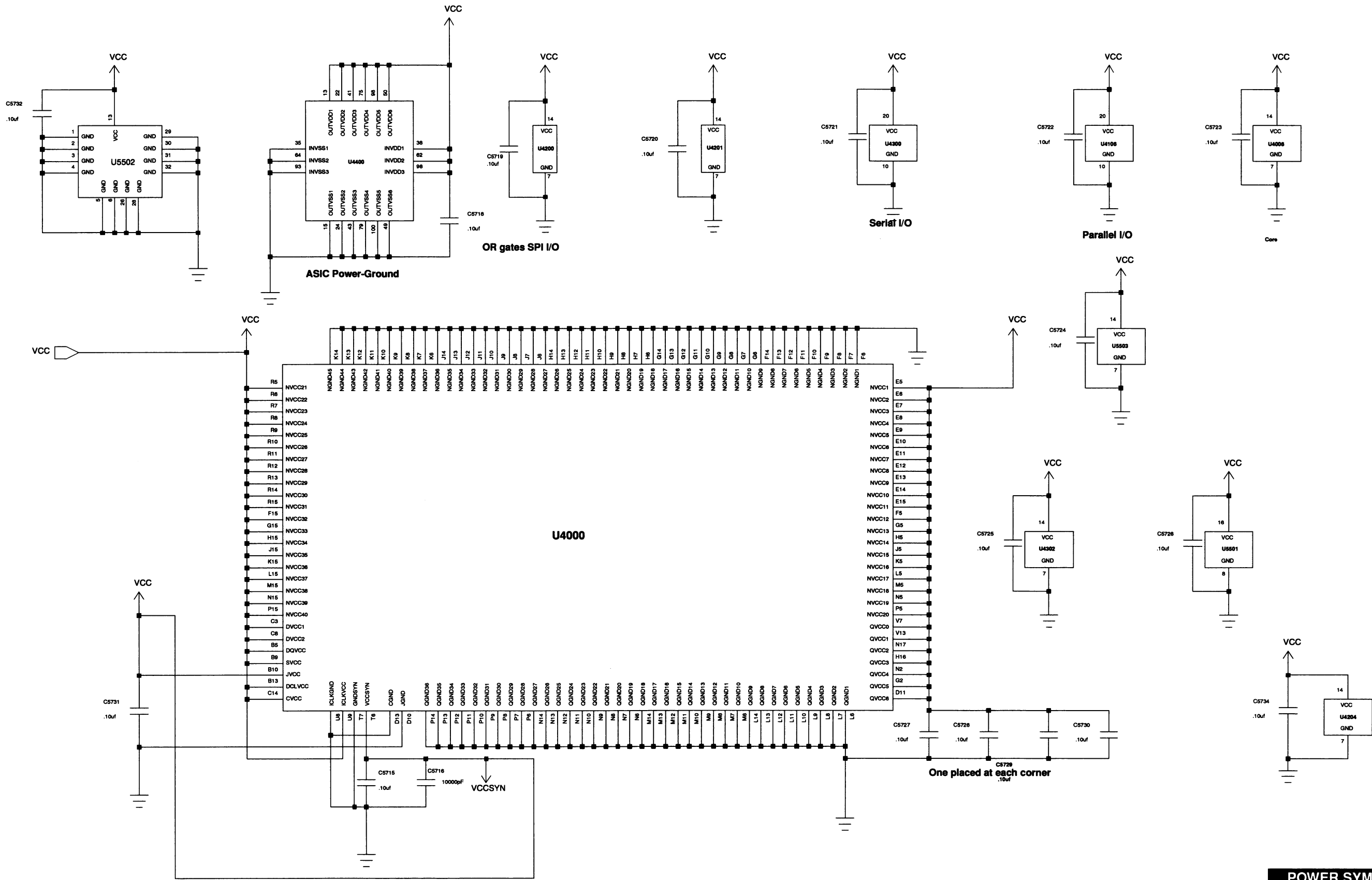
Reference	Type	Description
U5100	MC7805	Power Supply Regulator, 5V
U5102	MC33151	High Speed Dual Mosfet Driver
U5103	LP2951	Power Supply Regulator, adjustable

POWER DISTRIBUTION



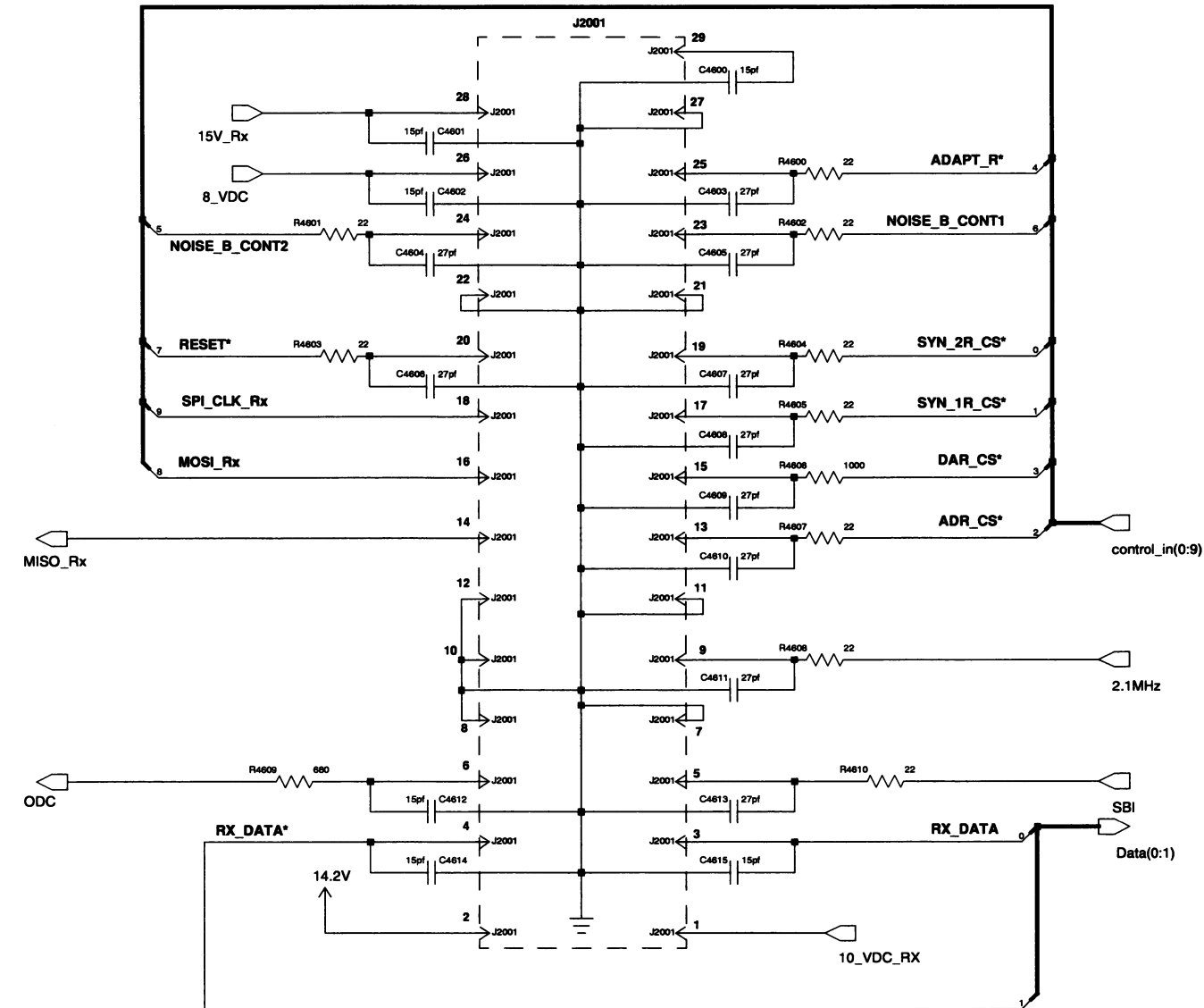
CONTROLLER TO BACKPLANE CONNECTOR

STATION CONTROL MODULES
MODEL TCN6273C

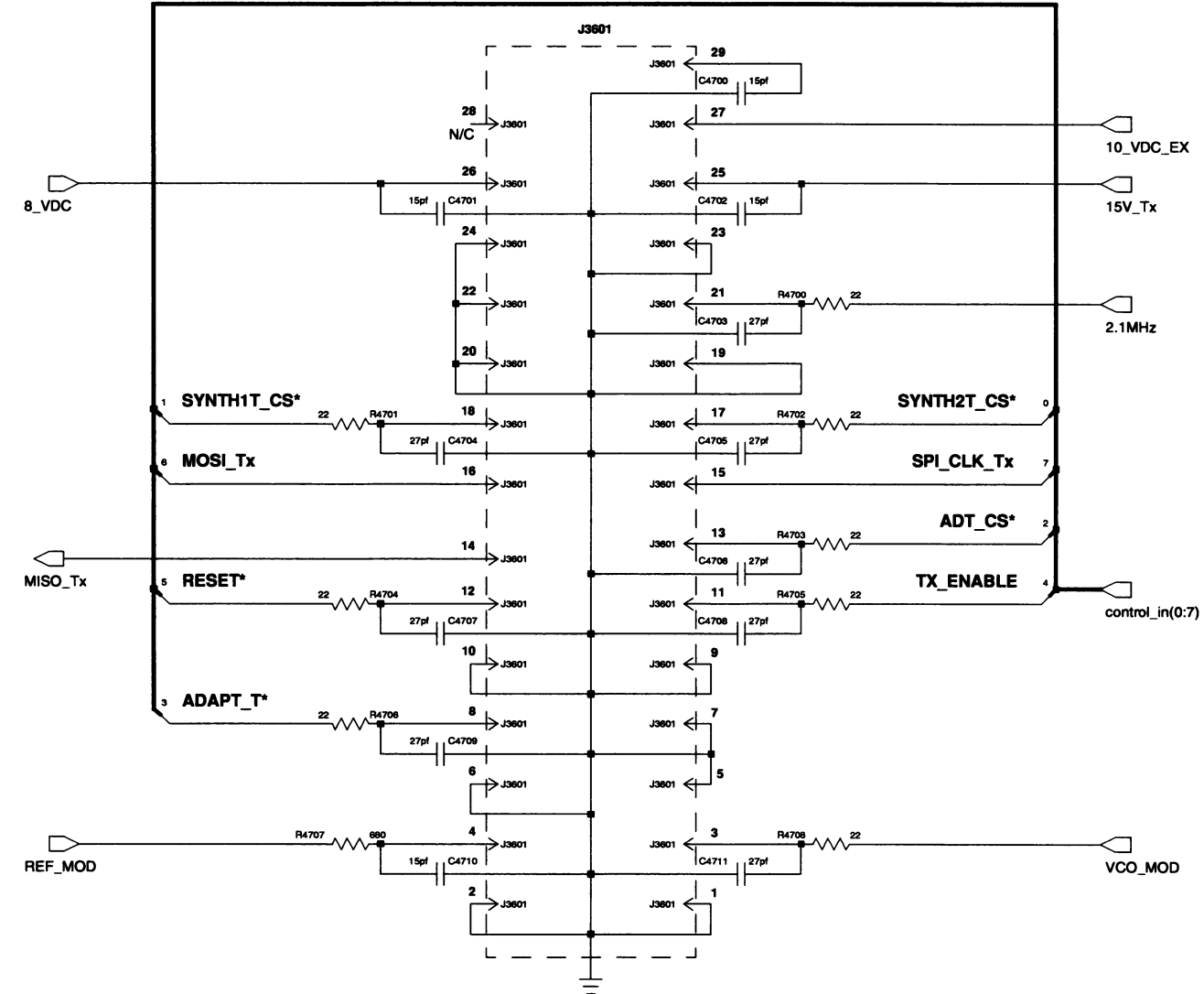


POWER SYMBOLS

STATION CONTROL MODULES
MODEL TCN6273C

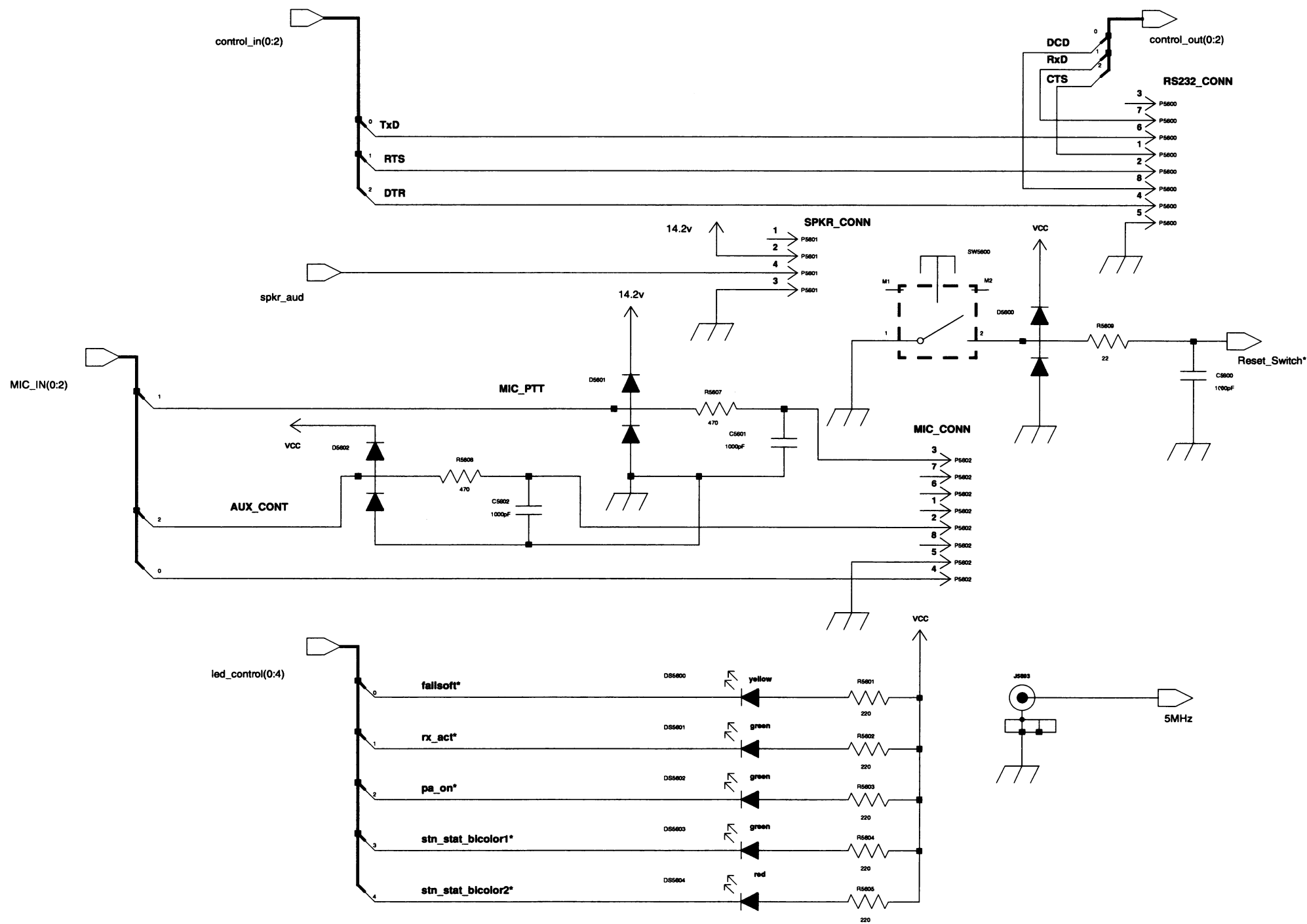


RECEIVER INTERFACE



EXCITER INTERFACE

STATION CONTROL MODULES
MODEL TCN6273C



FRONT PANEL

STATION CONTROL MODULES

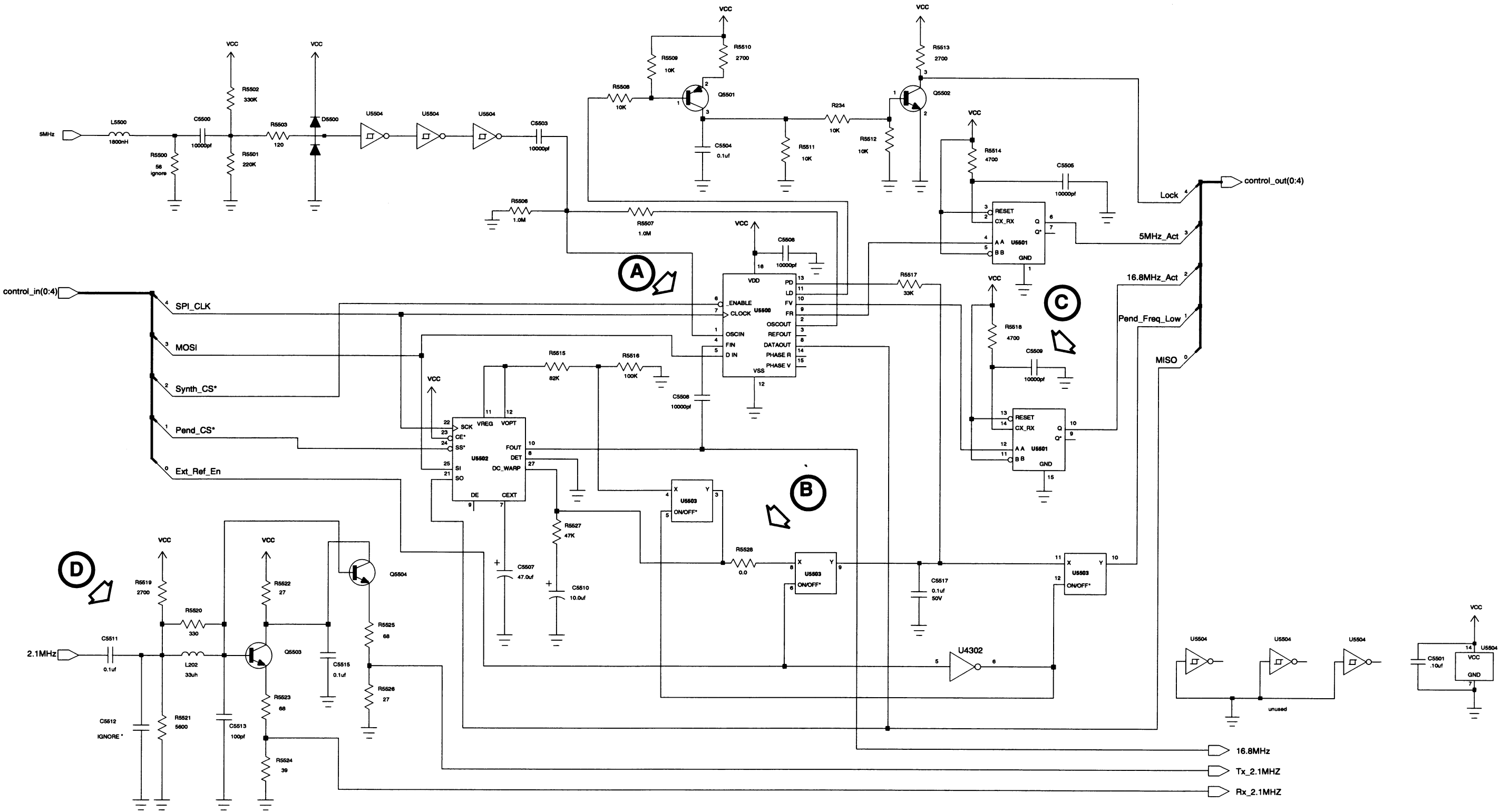
MODEL TCN6273C

Signal Path	Description/Nominal Signal Levels
Ⓐ	U5500. MC145170. PLL chip that compares a divided down version or the 5MHz reference to a divided down version of the 16.8MHz clock generated by the Pendulum chip, U5502.
Ⓑ	U5503 pins 8 and 9. Analog gate which closes the phase locked loop (by Ext_Ref_En) causing the 16.8 MHZ clock to track the 5MHz external input by affecting the DC_WARP input to U5502. When this gate is open, gate 11 /10 is closed. An essentially binary voltage will appear at "Pend_Freq_Low" indicating whether the Pendulum frequency is above or below 16.8MHz as referenced to the 5MHz external input. DC_WARP will be routed to a fixed voltage (gate 3/4) and the 16.8 MHz will not track the 5MHz signal.
Ⓒ	U5501 looks at the outputs of U5500 corresponding to the 5 and 16.8 MHz signals and gives an indication of whether or not the signals are present.
Ⓓ	Buffers for 2.1MHz signal to prevent noise transfer between receiver and exciter.

SCHEMATIC IC'S TABLE-REFERENCE

Reference	Type	Description
U5500	MC145170	PLL Frequency Synthesizer, with Serial Interface
U5501	MC74HC4538	Dual Precision Monostable Multivibrator
U5502	Custom IC	Reference Oscillator Module
U5503	74HC4066	Quad Analog Switch/Multiplexer/Demultiplexer

STATION CONTROL MODULES
MODEL TCN6273C



REFERENCE

STATION CONTROL MODULES
MODEL TCN6273C

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STATION CONTROL MODULE BOARD DETAIL HEAVY COMPONENT SIDE

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Board Detail (Sheet 32 of 36)
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Parts List

TCN6273C STATION CONTROL MODULE

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
CAPACITOR, FIXED: UF +/-10%; 100 V:		
UNLESS OTHERWISE STATED		
C4001,4002	2113743E20	CAP CHIP .10 UF 10%
C4003	2311049A07	1 uF, +/-10%; 16V
C4004 to 4008	2113743E20	CAP CHIP .10 UF 10%
C4010	2113741F49	0.01 uF, +/-5%; 50V
C4100 to 4106	2113743E20	CAP CHIP .10 UF 10%
C4200 to 4205	2113740F37	27 pF, +/-5%; 50V
C4206	2113740F29	12 pF, +/-5%; 50V
C4209 to 4212	2113743E20	CAP CHIP .10 UF 10%
C4300,4301	2311049A45	10 uF, +/-10%; 35 V
C4302	2113743E20	CAP CHIP .10 UF 10%
C4303,4304	2311049A45	10 uF, +/-10%; 35 V
C4305 to 4310	2113918A05	470 pF, +/-20%; 1000 V
C4400	2113743E20	CAP CHIP .10 UF 10%
C4401	2113743E09	0.027 uF, +/-10%; 16V
C4402 to 4405	2113743E20	CAP CHIP .10 UF 10%
C4500,4501	2113741F49	0.01 uF, +/-5%; 50V
C4503	2113743E20	CAP CHIP .10 UF 10%
C4506	2113743E20	CAP CHIP .10 UF 10%
C4507	2113741F49	0.01 uF, +/-5%; 50V
C4508	2311049A18	10 uF, +/-10%; 16V
C4510	2311049A18	10 uF, +/-10%; 16V
C4511	2113743A23	CAP CHIP .220 UF 10% X7R
C4512	2113743E20	CAP CHIP .10 UF 10%
C4516	2113743E12	0.047 uF, +/-10%; 16V
C4517	2113741F49	0.01 uF, +/-5%; 50V
C4518	2113743E20	CAP CHIP .10 UF 10%
C4520	2113740F51	100 pF, +/-5%; 50V
C4521	2311049A23	47 uF, +/-10%; 10 V
C4522	2113741F05	150 pF, +/-5%; 50V
C4523	2113741F49	0.01 uF, +/-5%; 50V
C4525	2113741F49	0.01 uF, +/-5%; 50V
C4526,4527	2311049A23	47 uF, +/-10%; 10 V
C4528,4529	2113743E20	CAP CHIP .10 UF 10%
C4530,4531	2311049A18	10 uF, +/-10%; 16V
C4532	2113743A23	CAP CHIP .220 UF 10% X7R
C4533	2113743E20	CAP CHIP .10 UF 10%
C4534	2113740F51	100 pF, +/-5%; 50V
C4535	2113743E12	0.047 uF, +/-10%; 16V
C4536	2311049A23	47 uF, +/-10%; 10 V
C4537	2113741F49	0.01 uF, +/-5%; 50V
C4538	2113743E20	CAP CHIP .10 UF 10%
C4540	2113743E20	CAP CHIP .10 UF 10%
C4541	2311049A08	1 uF, +/-10%; 35 V
C4542,4543	2113741F49	0.01 uF, +/-5%; 50V
C4544	2113918A05	470 pF, +/-20%; 1000 V
C4545	2113741F05	150 pF, +/-5%; 50V
C4546	2113741F49	0.01 uF, +/-5%; 50V
C4547	2311049A23	47 uF, +/-10%; 10 V
C4548	2113741F49	0.01 uF, +/-5%; 50V
C4549	2311049A18	10 uF, +/-10%; 16V
C4550	2113740F51	100 pF, +/-5%; 50V
C4551	2113743E20	CAP CHIP .10 UF 10%
C4552	2311049A23	47 uF, +/-10%; 10 V
C4553	2113918A05	470 pF, +/-20%; 1000 V
C4554	2113743E20	CAP CHIP .10 UF 10%
C4555	2113743E12	0.047 uF, +/-10%; 16V
C4556	2311049A18	10 uF, +/-10%; 16V
C4557	2113743E12	0.047 uF, +/-10%; 16V
C4558	2113740F51	100 pF, +/-5%; 50V
C4559	2311049A23	47 uF, +/-10%; 10 V
C4560	2113741F49	0.01 uF, +/-5%; 50V
C4562 to 4567	2113743E12	0.047 uF, +/-10%; 16V
C4568,4569	2113741F49	0.01 uF, +/-5%; 50V
C4570	2113743E12	0.047 uF, +/-10%; 16V
C4571	2113740F51	100 pF, +/-5%; 50V
C4600 to 4602	2113740F31	15 pF, +/-5%; 50V
C4603 to 4611	2113740F37	27 pF, +/-5%; 50V
C4612	2113740F31	15 pF, +/-5%; 50V
C4613	2113740F37	27 pF, +/-5%; 50V
C4614,4615	2113740F31	15 pF, +/-5%; 50V
C4700 to 4702	2113740F31	15 pF, +/-5%; 50V
C4703 to 4709	2113740F37	27 pF, +/-5%; 50V
C4710	2113740F31	15 pF, +/-5%; 50V
C4711	2113740F37	27 pF, +/-5%; 50V
C4800 to 4808	2113741F25	1000 pF, +/-5%; 50V
C4900	2113741F17	470 pF, +/-5%; 50V
C4901,4902	2113741F25	1000 pF, +/-5%; 50V
C4903	2113741F17	470 pF, +/-5%; 50V
C4904	2113741F25	1000 pF, +/-5%; 50V

TCN6273C STATION CONTROL MODULE

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C4905	2113741F17	470 pF, +/-5%; 50V
C4906	2113741F25	1000 pF, +/-5%; 50V
C4907	2113741F17	470 pF, +/-5%; 50V
C4908	2113741F25	1000 pF, +/-5%; 50V
C4909 to 4912	2113741F17	470 pF, +/-5%; 50V
C4913,4914	2113741F25	1000 pF, +/-5%; 50V
C5000 to 5009	2113741F25	1000 pF, +/-5%; 50V
C5100	2113743E20	CAP CHIP .10 UF 10%
C5101	2380090M11	33 uF, +/-20%; 25V
C5102	2113741F29	1500 pF, +/-5%; 50V
C5103	2113741F25	1000 pF, +/-5%; 50V
C5104	2113743E20	CAP CHIP .10 UF 10%
C5105	2380090M11	33 uF, +/-20%; 25V
C5106,5107	2113743E20	CAP CHIP .10 UF 10%
C5108	2380090M24	10 uF, +/-20%; 50 V
C5109	2380090M11	33 uF, +/-20%; 25V
C5110	2113743E20	CAP CHIP .10 UF 10%
C5111	2380090M24	10 uF, +/-20%; 50 V
C5112	2113741F49	0.01 uF, +/-5%; 50V
C5113	2311049A21	22 uF, +/-10%; 20 V
C5114,5115	2113743E20	CAP CHIP .10 UF 10%
C5116	2380090M11	33 uF, +/-20%; 25V
C5117,5118	2113741F49	0.01 uF, +/-5%; 50V
C5119 to 5121	2113741F29	1500 pF, +/-5%; 50V
C5200 to 5205	2113741F25	1000 pF, +/-5%; 50V
C5300,5301	2113741F25	1000 pF, +/-5%; 50V
C5303 to 5326	2113741F25	1000 pF, +/-5%; 50V
C5400 to 5402	2113741F25	1000 pF, +/-5%; 50V
C5500	2113741A45	0.01 uF, +/-5%; 50 V
C5501	2113743E20	CAP CHIP .10 UF 10%
C5503	2113741A45	0.01 uF, +/-5%; 50 V
C5504	2113741B69	0.1 uF, +/-5%; 50 V
C5505,5506	2113741A45	0.01 uF, +/-5%; 50 V
C5507	2311049A23	47 uF, +/-10%; 10 V
C5508,5509	2113741A45	0.01 uF, +/-5%; 50 V
C5510	2311049A45	10 uF, +/-10%; 35 V
C5511	2113741B69	0.1 uF, +/-5%; 50 V
C5513	2113740A55	100 pF, +/-5%; 50 V
C5515	2113741B69	0.1 uF, +/-5%; 50 V
C5517	2113741B69	0.1 uF, +/-5%; 50 V
C5600 to 5602	2113741F25	1000 pF, +/-5%; 50V
C5715	2113743E20	CAP CHIP .10 UF 10%
C5716	2113741F49	0.01 uF, +/-5%; 50V
C5717	2113741F25	1000 pF, +/-5%; 50V
C5718 to 5732	2113743E20	CAP CHIP .10 UF 10%
C5734	2113743E20	CAP CHIP .10 UF 10%
DIODE: (SEE NOTE)		
D4000	4813833C11	Diode Gen Purpose .2A,250V,A82
D4001 to 4003	4813825A05	Hot Carrier
D4400 to 4402	4813825A05	Hot Carrier
D4500,4501	4813825A05	Hot Carrier
D4800 to 4805	4813833C05	dual 70 V
D5000 to 5002	4813833C05	dual 70 V
D5004 to 5006	4813833C05	dual 70 V
D5100	4813833C05	dual 70 V
D5102	4813833C07	dual 100W
D5200	4813833C05	dual 70 V
D5300 to 5304	4813833C05	dual 70 V
D5500	4813833C05	dual 70 V
D5600 to 5602	4813833C05	dual 70 V
LIGHT EMITTING DIODE: (SEE NOTE)		
DS5600	4882198T05	Subminiature LED YEL SM
DS5601 to 5603	4882198T06	Subminiature LED GRN SM
DS5604	4882198T04	Subminiature LED RED SM
CONNECTOR, RECEPTACLE:		
J2001	0982727X01	Receptacle 29 PIN RA
J3601	0982727X01	Receptacle 29 PIN RA
J5603	0982492W01	BNC Conn. PCB Vertical Receptacle
COIL, INDUCTOR:		
L202	2411087A44	33 uH
L4200	2462587N71	1800 nH, +/-5%
L4201,4202	2462587N69	1200 NH, 5%
L5100 to 5102	2484657R01	ferrite bead
L5500	2462587N71	1800 nH, +/-5%
CONNECTOR, PLUG:		
P3	2883562R04	PLUG, EUROCARD 96 PIN R A

TCN6273C STATION CONTROL MODULE

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
P5600	0982566W03	JACK MOD VERT 8-PIN
P5601	0982566W02	JACK MOD VERT 4-PIN
P5602	0982566W03	JACK MOD VERT 8-PIN
TRANSISTOR: (SEE NOTE)		
Q4100	4813824A10	NPN
Q4101	4884955T01	NPN
Q4400,4401	4813824A10	NPN
Q4402	4813824A17	PNP
Q4403	4813824A10	NPN
Q4800 to 4802	4884955T01	NPN
Q5200,5201	4884955T01	NPN
Q5300	4813824A11	NPN
Q5301	4884955T01	NPN
Q5501	4813824A17	PNP
Q5502 to 5504	4813824A10	NPN
RESISTOR, FIXED: +/-5%; 1/16 W:		
UNLESS OTHERWISE STATED		
R234	0662057A73	CHIP RES 10K OHMS
R4000	0662057A73	CHIP RES 10K OHMS
R4001	0662057A65	CHIP RES 4700 OHMS
R4002,4003	0662057A73	CHIP RES 10K OHMS
R4004	0662057A51	CHIP RES 1200 OHMS
R4005 to 4010	0662057A73	CHIP RES 10K OHMS
R4013 to 4020	0662057A51	CHIP RES 1200 OHMS
R4021,4022	0662057A89	CHIP RES 47K OHMS
R4026 to 4041	0662057A89	CHIP RES 47K OHMS
R4044 to 4049	0662057A89	CHIP RES 47K OHMS
R4051	0662057A73	CHIP RES 10K OHMS
R4052	0662057A65	CHIP RES 4700 OHMS
R4100	0662057A49	CHIP RES 1000 OHMS
R4101	0662057A65	CHIP RES 4700 OHMS
R4102	0662057B47	CHIP RES 0 OHMS +/- .050 OHMS
R4104	0662057A65	CHIP RES 4700 OHMS
R4105	0662057B47	CHIP RES 0 OHMS +/- .050 OHMS
R4106 to 4112	0662057A73	CHIP RES 10K OHMS
R4200,4201	0662057A09	CHIP RES 22 OHMS
R4202	0662057A27	CHIP RES 120 OHMS
R4203,4204	0662057A09	CHIP RES 22 OHMS
R4205	0662057A27	CHIP RES 120 OHMS
R4206 to 4209	0662057A97	CHIP RES 100K OHMS
R4210	0662057A51	CHIP RES 1200 OHMS
R4211	0662057A59	CHIP RES 2700 OHMS
R4212 to 4214	0662057A73	CHIP RES 10K OHMS
R4215 to 4217	0662057A45	CHIP RES 680 OHMS
R4219	0662057A65	CHIP RES 4700 OHMS
R4220	0662057A61	CHIP RES 3300 OHMS
R4221	0662057A73	CHIP RES 10K OHMS
R4222	0662057A89	CHIP RES 47K OHMS
R4223	0662057A65	CHIP RES 4700 OHMS
R4224	0662057A77	CHIP RES 15K OHMS
R4225 to 4227	0662057A73	CHIP RES 10K OHMS
R4228	0662057A97	CHIP RES 100K OHMS
R4300 to 4305	0611072A25	100 ohms, +/-5%; 1/4 W
R4306,4307	0662057A97	CHIP RES 100K OHMS
R4400	0662057A73	CHIP RES 10K OHMS
R4401,4402	0662057A65	CHIP RES 4700 OHMS
R4403 to 4406	0662057A73	CHIP RES 10K OHMS
R4407,4408	0662057A89	CHIP RES 47K OHMS
R4409	0662057A57	CHIP RES 2200 OHMS
R4410	0662057A35	CHIP RES 270 OHMS
R4411	0662057A37	CHIP RES 330 OHMS
R4412	0662057A55	CHIP RES 1800 OHMS
R4413	0662057A59	CHIP RES 2700 OHMS
R4414	0662057A55	CHIP RES 1800 OHMS
R4415,4416	0662057A73	CHIP RES 10K OHMS
R4417 to 4419	0662057A89	CHIP RES 47K OHMS
R4429,4430	0662057A73	CHIP RES 10K OHMS
R4502	0611079A13	RES FIXED CHIP 3.0 5 1/10W A/P
R4512	0662057A87	CHIP RES 39K OHMS
R4513,4514	0662057A73	CHIP RES 10K OHMS
R4515	0662057A88	CHIP RES 43K OHMS
R4516	0662057A81	CHIP RES 22K OHMS
R4517,4518	0662057A88	CHIP RES 43K OHMS
R4519	0662057A79	CHIP RES 18K OHMS
R4520	0662057A97	CHIP RES 100K OHMS
R4521	0611079A13	RES FIXED CHIP 3.0 5 1/10W A/P
R4522,4523	0662057A88	CHIP RES 43K OHMS
R4524	0662057A81	CHIP RES 22K OHMS
R4525,4526	0662057A73	CHIP RES 10K OHMS

TCN6273C STATION CONTROL MODULE

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R4527	0662057A88	CHIP RES 43K OHMS
R4528,4529	0662057A73	CHIP RES 10K OHMS
R4530	0662057A09	CHIP RES 22 OHMS
R4531	0662057A88	CHIP RES 43K OHMS
R4532,4533	0662057A73	CHIP RES 10K OHMS
R4534	0662057A97	CHIP RES 100K OHMS
R4535	0662057A81	CHIP RES 22K OHMS
R4536	0662057A73	CHIP RES 10K OHMS
R4537	0662057A75	CHIP RES 12K OHMS
R4538	0662057A95	CHIP RES 82K OHMS
R4539	0662057A57	CHIP RES 2200 OHMS
R4540	0662057A43	CHIP RES 560 OHMS
R4541 to 4543	0662057A73	CHIP RES 10K OHMS
R4544	0662057A89	CHIP RES 47K OHMS
R4545	0662057A77	CHIP RES 15K OHMS
R4546	0662057A81	CHIP RES 22K OHMS
R4547 to 4549	0662057A73	CHIP RES 10K OHMS
R4550	0662057A80	CHIP RES 20K OHMS
R4551,4552	0662057A73	CHIP RES 10K OHMS
R4553	0662057A90	CHIP RES 51K OHMS
R4554	0662057A87	CHIP RES 39K OHMS
R4555	0611079D51	RES CHIP 332.0 1/10W 1%
R4556	0611079D73	RES CHIP 562.0 1/10W 1%
R4557	0611079D51	RES CHIP 332.0 1/10W 1%
R4558,4559	0662057A80	CHIP RES 20K OHMS
R4560	0662057A73	CHIP RES 10K OHMS
R4561	0662057A80	CHIP RES 20K OHMS
R4562	0662057A73	CHIP RES 10K OHMS
R4563	0662057A80	CHIP RES 20K OHMS
R4564	0662057A73	CHIP RES 10K OHMS
R4565	0662057A80	CHIP RES 20K OHMS
R4566	0662057A73	CHIP RES 10K OHMS
R4567	0662057A80	CHIP RES 20K OHMS
R4568	0662057A73	CHIP RES 10K OHMS
R4569	0662057A80	CHIP RES 20K OHMS
R4570	0662057A73	CHIP RES 10K OHMS
R4571	0662057A80	CHIP RES 20K OHMS
R4572	0662057A49	CHIP RES 1000 OHMS
R4573	0662057A71	CHIP RES 8200 OHMS
R4575	0662057A63	CHIP RES 3900 OHMS
R4576,4577	0662057A73	CHIP RES 10K OHMS
R4580 to 4584	0662057B47	CHIP RES 0 OHMS +/- .050 OHMS
R4600 to 4605	0662057A09	CHIP RES 22 OHMS
R4606	0662057A49	CHIP RES 1000 OHMS
R4607,4608	0662057A09	CHIP RES 22 OHMS
R4609	0662057A45	CHIP RES 680 OHMS
R4610	0662057A09	CHIP RES 22 OHMS
R4700 to 4706	0662057A09	CHIP RES 22 OHMS
R4707	0662057A45	CHIP RES 680 OHMS
R4708	0662057A09	CHIP RES 22 OHMS
R4800	0662057A09	CHIP RES 22 OHMS
R4801 to 4804	0662057A41	CHIP RES 470 OHMS
R4805	0662057A09	CHIP RES 22 OHMS
R4806	0662057A41	CHIP RES 470 OHMS
R4807	0662057A09	CHIP RES 22 OHMS
R4808 to 4810	0662057A41	CHIP RES 470 OHMS
R4900	0662057A25	CHIP RES 100 OHMS
R4901,4902	0662057A41	CHIP RES 470 OHMS
R4903	0662057A25	CHIP RES 100 OHMS
R4904	0662057A41	CHIP RES 470 OHMS
R4905	0662057A25	CHIP RES 100 OHMS
R4906	0662057A41	CHIP RES 470 OHMS
R4907	0662057A25	CHIP RES 100 OHMS
R4908	0662057A41	CHIP RES 470 OHMS
R4909 to 4912	0662057A25	CHIP RES 100 OHMS
R4913,4914	0662057A41	CHIP RES 470 OHMS
R5000 to 5009	0662057A41	CHIP RES 470 OHMS
R5100	0662057A41	CHIP RES 470 OHMS
R5101	0611079F01	Resistor: chip 1.00K 1/10 W
R5102	0611079F93	RES CHIP 9.09K 1/10W 1% 0805
R5103	0662057A01	CHIP RES 10 OHMS
R5104	0611079F01	Resistor: chip 1.00K 1/10 W
R5105	0611077F94	10.7K, +/-1%; 1/8 W
R5200	0662057A41	CHIP RES 470 OHMS
R5201	0662057A09	CHIP RES 22 OHMS
R5202	0662057A41	CHIP RES 470 OHMS
R5203	0662057A09	CHIP RES 22 OHMS
R5204,5205	0662057A41	CHIP RES 470 OHMS
R5300,5301	0662057A41	CHIP RES 470 OHMS
R5303 to 5319	0662057A41	CHIP RES 470 OHMS
R5321 to 5324	0662057A41	CHIP RES 470 OHMS

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Parts List (Sheet 34 of 36)

01/05/97

TCN6273C STATION CONTROL MODULE

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R5325	0611072A30	160 ohms, +/-5%; 1/4W
R5326,5327	0662057A41	CHIP RES 470 OHMS
R5400 to 5402	0662057A41	CHIP RES 470 OHMS
R5501	0662057B06	CHIP RES 220K OHMS
R5502	0662057B10	CHIP RES 330K OHMS
R5503	0662057A27	CHIP RES 120 OHMS
R5506,5507	0662057B22	CHIP RES 1.0 MEG OHMS
R5508,5509	0662057A73	CHIP RES 10K OHMS
R5510	0662057A59	CHIP RES 2700 OHMS
R5511,5512	0662057A73	CHIP RES 10K OHMS
R5513	0662057A59	CHIP RES 2700 OHMS
R5514	0662057A65	CHIP RES 4700 OHMS
R5515	0662057A95	CHIP RES 82K OHMS
R5516	0662057A97	CHIP RES 100K OHMS
R5517	0662057A85	CHIP RES 33K OHMS
R5518	0662057A65	CHIP RES 4700 OHMS
R5519	0662057A59	CHIP RES 2700 OHMS
R5520	0662057A37	CHIP RES 330 OHMS
R5521	0662057A67	CHIP RES 5600 OHMS
R5522	0662057A11	CHIP RES 27 OHMS
R5523	0662057A21	CHIP RES 68 OHMS
R5524	0611079A40	39 ohms, 1/10 W
R5525	0662057A21	CHIP RES 68 OHMS
R5526	0662057A11	CHIP RES 27 OHMS
R5527	0662057A89	CHIP RES 47K OHMS
R5528	0611079A01	0 ohms, 1/10 W
R5601 to 5605	0611079A58	220 ohms, 1/10 W
R5606 to 5608	0662057A41	CHIP RES 470 OHMS
R5609	0662057A09	CHIP RES 22 OHMS
R5610	0662057A77	CHIP RES 15K OHMS
INTEGRATED CIRCUIT: (SEE NOTE)		
U4000	5182561W01	IC DCHP-68356-OMPAC
U4001,4002	5184830T01	IC 128KX8 SRAM -628128- SM
U4003	5191056C03	IC MEM FLASH 1 MEGX8 SM
U4004	5113808A20	1 of 8 Decoder/Demultiplexer
U4005	5113808A40	Octal 3-State Non-Inverter Line Driver/Receiver
U4006	5113808A07	Quad 2-Input AND Gate
U4007	5182928X01	IC SUPERVISOR CKT MAX703
U4100	5113805A60	Octal D, Flip-Flop
U4101,4102	5113805A35	IC DECODER/DEMUX 10F16 HC154DW
U4103 to 4105	5113805A60	Octal D, Flip-Flop
U4106	5113805A54	Octal Buffer Line Driver/Receiver
U4107	5113805A60	Octal D, Flip-Flop
U4200,4201	5113808A14	Quad 2-Input OR Gate
U4202	5113811A08	IC; 8-bit
U4203	5113805A42	8-Bit Shifter Register
U4204	5113808A07	Quad 2-Input AND Gate
U4300	5113805A54	Octal Buffer Line Driver/Receiver
U4301	5113811A11	Single Supply Driver/Receiver
U4302	5113808A05	Hex Inverter
U4400	5184625T06	IC, ASIC OUTLAW GLUE
U4401 to 4403	5184531T08	IC SRAM 32X8 12NS EXT TEMP
U4501	5113808A16	Dual D-type Flip-Flop
U4502	5182718X01	IC CODE C -1027- SM
U4503	5113819A05	High Performance, Single Supply
U4505	5113805A84	Mux/Demux, Dual 4-Channel Analog
U4506	5113819A05	High Performance, Single Supply
U4507	5113805A84	Mux/Demux, Dual 4-Channel Analog
U4508	5182802R38	Digital Pot Converter
U4509	5113819A14	IC QD OP AMP _33204_
U4510	5182718X01	IC CODE C -1027- SM
U4511	5113805A85	Mux/Demux, Trip 2-Channel Analog
U4513	5184743T01	CODEC Pulse Code Modulation
U4514	5182802R38	Digital Pot Converter
U4518	5113819A05	High Performance, Single Supply
U4519	5113818A14	IC DL OP AMP RAIL TO RAIL
U5100	5113816G04	+5V Voltage Regulator
U5101	5113816A22	IC LOW DRPOUT UPWR V RGLTR 5V
U5102	5182276R73	IC DUAL MOSFET DVR _33151_
U5103	5113816A22	IC LOW DRPOUT UPWR V RGLTR 5V
U5500	5184717T01	Synthesizer with Serial Interface
U5501	5113805A89	Monostable Multivibrator, Dual Precision
U5502	5184726T02	REFERENCE OSC MODULE
U5503	5113805A86	Quad Analog Multiplexer/Demultiplexer
U5504	5113808A13	Hex Inverter Schmitt Trigger

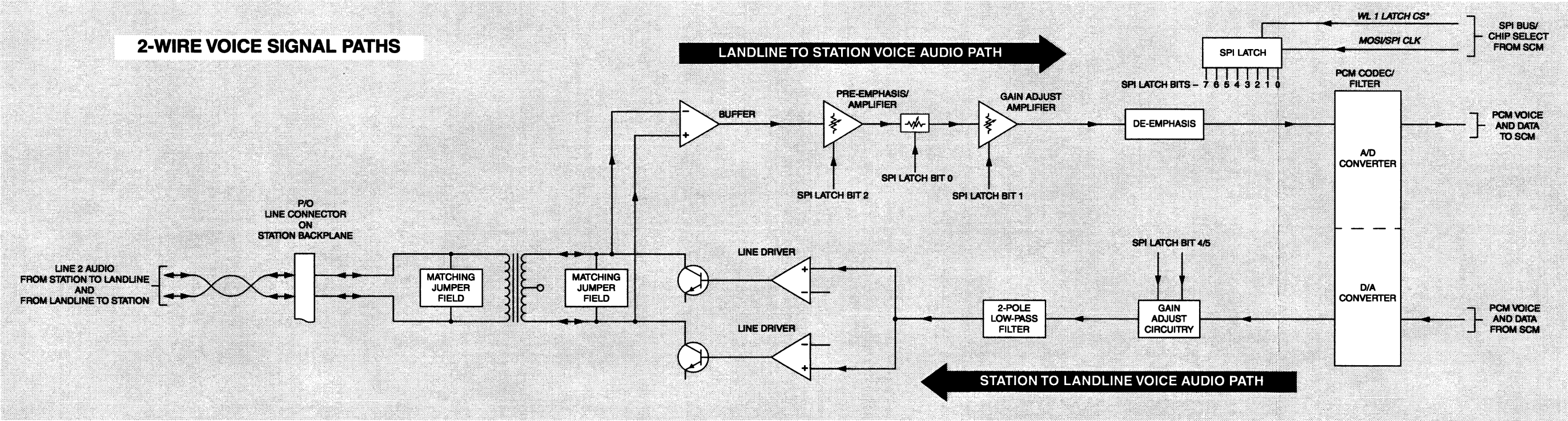
TCN6273C STATION CONTROL MODULE

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
<p>Note: For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.</p>		
<p>Note: Parts lists differences for board versions C and B are detailed in a table on the following page. The TCN6273C part list in this manual section reflects the latest production build of the station control module.</p>		

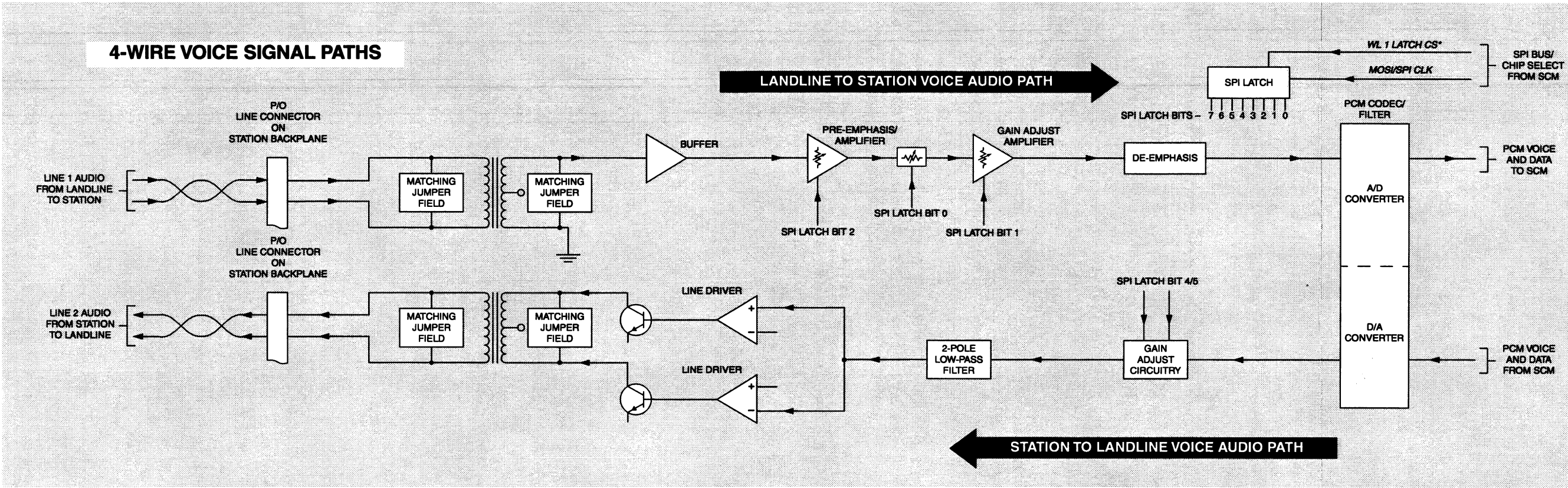
68P81094E31-B/C Station Control Module Changes

NOTE: The following table details the changes that have been made on the control board from Issue B to C.

Reference Symbol	Board Issue	Motorola Part No.	Description
NB0001	B	8482501W03	Issue B PC Board
NB0003	C	8482501W04	Issue C PC Board
Q4101	B	4813824A10	NPN
	C	4884955T01	NPN
R4052	C	0662057A65	Chip Res 4700 Ohms
R4104	B	0662057A87	Chip Res 39k Ohms
	C	0662057A65	Chip Res 4700 Ohms
R4105	B	0662057A97	Chip Res 100k Ohms
	C	0662057B47	Chip Res 0 Ohms
R4111	C	0662057A73	Chip Res 10k Ohms
U4003	B	5191056C02	IC Programmed EPROM
	C	5191056C03	IC Mem Flash 1 Megx8 SM



TTN5066A 2-WIRE VOICE AUDIO PATH FUNCTIONAL BLOCK DIAGRAM

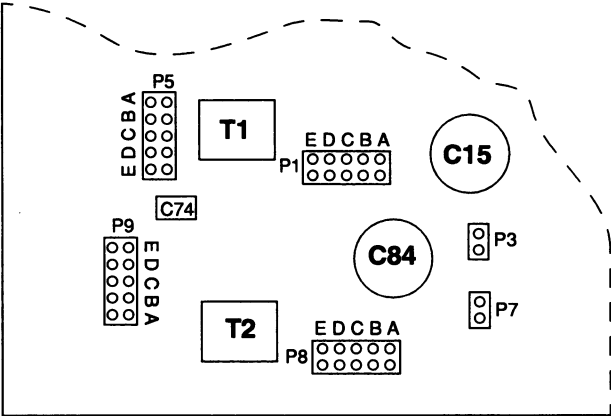


TTN5066A 4-WIRE VOICE AUDIO PATH FUNCTIONAL BLOCK DIAGRAM

EURO WIB MODULE
MODEL TTN5066A

√ = Jumper In
A = Pin 1 connects to Pin 2
* This setting represents a standard 60088 matching and is the factory default.
B = Pin 3 connects to Pin 4
C = Pin 5 connects to Pin 6
D = Pin 7 connects to Pin 8
E = Pin 9 connects to Pin 10

Note: Canada and the U.S wireline requirements are supported by Wireline board module TTN5067.

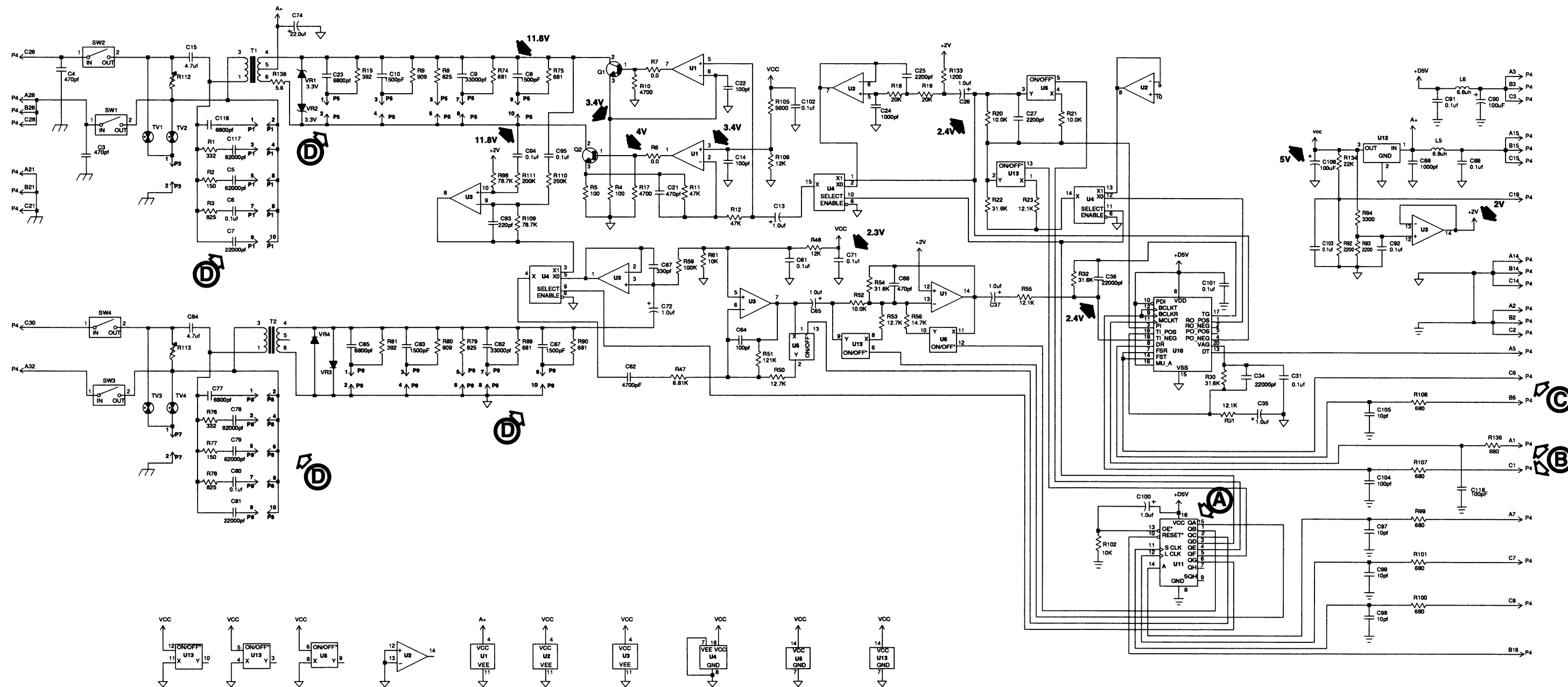


Country	P1, P5, P8, P9					P3, P7
	A *	B	C	D	E	
Australia			√			√
Austria			√			√
Belgium			√			√
Cyprus	√					√
Denmark				√		√
Finland		√				√
Former USSR	√					√
Former Yugoslavia	√					√
France		√				√
Germany (2-wire)			√			√
Germany (4-wire)	√					√
Greece	√					√
Ireland				√		√
Italy	√					√
Luxemburg			√			√
Netherlands	√					√
Norway		√				
Portugal	√					√
South Africa			√			√
Spain			√			√
Sweden					√	
Switzerland			√			
UK				√		√

Signal Path	Description/Nominal Signal Levels
Ⓐ	The SPI LATCH U11 is used to configure the WIB by means of several MUXs and Analog switches. The output pins 1 to 6 and pin 15 drive the select inputs of the configuration path switches and amplification step switches. On the TTN 5068A (8-Wire) a second SPI Latch (U15) is used to configure the two additional paths in the same manner as above.
Ⓑ	The continuous Master Clock and the Bit Clock are essential for the correct data transfer and data sampling. Both are square waves with the duty cycle 1:1 with a period of 3,9 usec.
Ⓒ	The continuous Frame Sync Clock starts the PCM serial Block Transfer The waveform is a needle pulse train with a repetition rate of 125 usec .
Ⓓ	The Jumper fields P1, P5, P8 and P9 have to have in any case jumpers set. When running the board without any jumpers the correct function cannot be guaranteed. (undefined matching). The default jumper setting is for 600 Ohms (Position A)

Configuration Mode	U11/Pin#	State (Volt)	Remarks
4-Wire Mode	6	0	
2-Wire Mode	6	5.1	Only active line is L2
Analog Voice Mode	3	0	

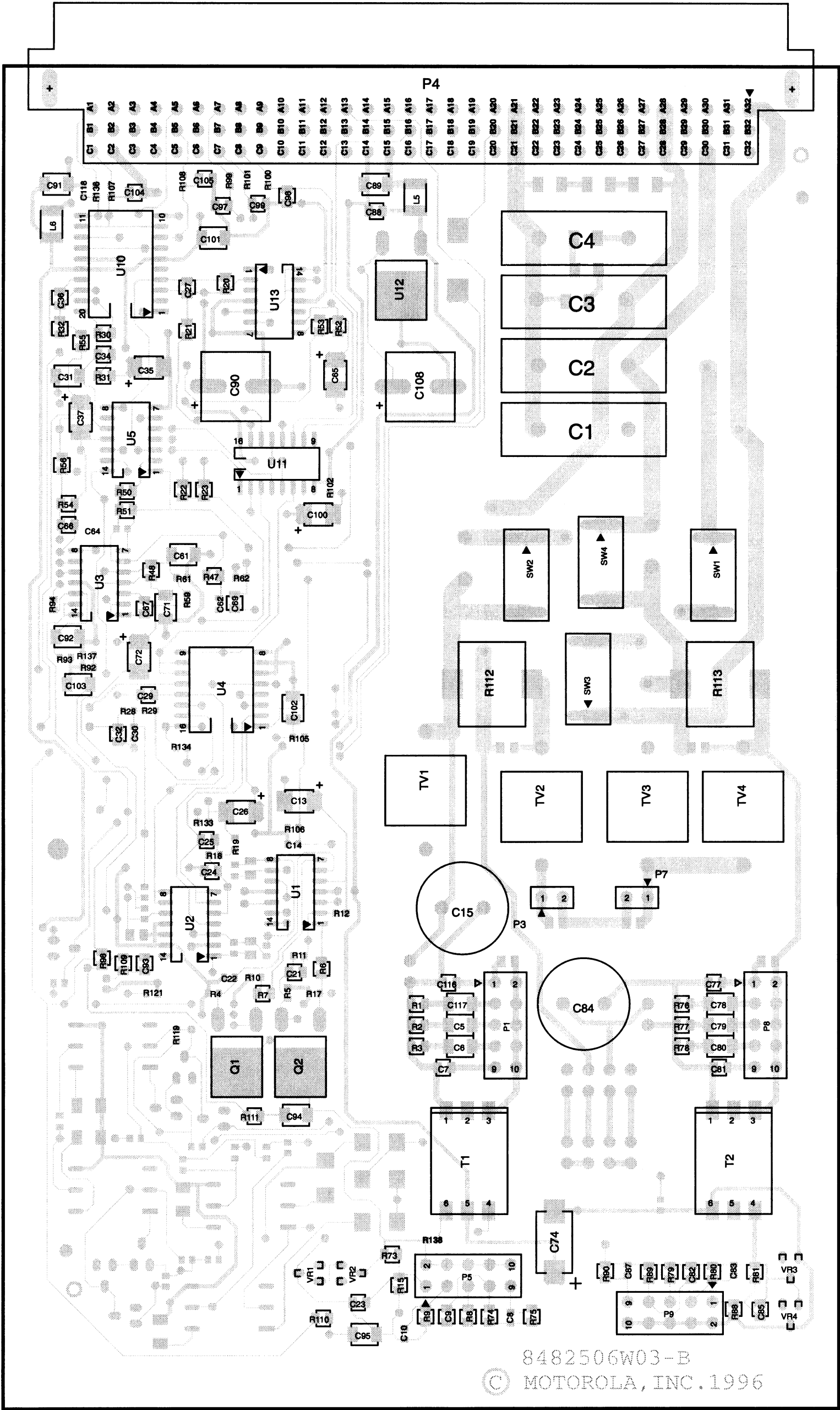
EURO WIB MODULE
MODEL TTN5066A



TTN5066A 4-WIRE EURO WIB SCHEMATIC

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EURO WIB MODULE
MODEL TTN5066A



8482506W03-B

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TTN5066A 4-WIRE VOICE AUDIO BOARD DETAIL

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Parts List

TTN5066A 4-Wire Euro WIB

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
CAPACITOR, FIXED: UF +/-10%; 100 V: UNLESS OTHERWISE STATED		
C3,4	2183405X01	CAPACITOR CERAMIC HIGH VOLTAGE
C5	2113741B64	0.062 uF, +/-5%; 50V
C6	2113741B69	0.1 uF, +/-5%; 50 V
C7	2113741A53	0.022 uF, +/-5%; 50 V
C8	2113741F29	1500 pF, +/-5%; 50V
C9	2113741A57	0.033 uF, +/-5%; 50 V
C10	2113741F29	1500 pF, +/-5%; 50V
C13	2311049A08	1 uF, +/-10%; 35 V
C14	2113740F51	100 pF, +/-5%; 50V
C15	2382174V01	4.7 uF, +/-20%; 200 V
C21	2113740A71	470 pF, +/-5%; 50 V
C22	2113740F51	100 pF, +/-5%; 50V
C23	2113741A41	6800 pF, +/-5%; 50 V
C24	2113740A79	1000 pF, +/-5%; 50 V
C25	2113741A29	2200 pF, +/-5%; 50 V
C26	2311049A08	1 uF, +/-10%; 35 V
C27	2113741A29	2200 pF, +/-5%; 50 V
C31	2113741B69	0.1 uF, +/-5%; 50 V
C34	2113741A53	0.022 uF, +/-5%; 50 V
C35	2311049A08	1 uF, +/-10%; 35 V
C36	2113741A53	0.022 uF, +/-5%; 50 V
C37	2311049A08	1 uF, +/-10%; 35 V
C61	2113741B69	0.1 uF, +/-5%; 50 V
C62	2113741F41	4700 pF, +/-5%; 50V
C64	2113740F51	100 pF, +/-5%; 50V
C65	2311049A08	1 uF, +/-10%; 35 V
C66	2113740A71	470 pF, +/-5%; 50 V
C67	2113740A67	330 pF, +/-5%; 50 V
C71	2113741B69	0.1 uF, +/-5%; 50 V
C72	2311049A08	1 uF, +/-10%; 35 V
C74	2311049A21	22 uF, +/-10%; 20 V
C77	2113741A41	6800 pF, +/-5%; 50 V
C78	2113741B67	0.082 uF, +/-5%; 50V
C79	2113741B64	0.062 uF, +/-5%; 50V
C80	2113741B69	0.1 uF, +/-5%; 50 V
C81	2113741A53	0.022 uF, +/-5%; 50 V
C82	2113741A57	0.033 uF, +/-5%; 50 V
C83	2113741F29	1500 pF, +/-5%; 50V
C84	2382174V01	4.7 uF, +/-20%; 200 V
C85	2113741A41	6800 pF, +/-5%; 50 V
C87	2113741F29	1500 pF, +/-5%; 50V
C88	2113740A79	1000 pF, +/-5%; 50 V
C89	2113741B69	0.1 uF, +/-5%; 50 V
C90	2380090M36	CAP 100 UF 25V
C91,92	2113741B69	0.1 uF, +/-5%; 50 V
C93	2113740A63	220 pF, +/-5%; 50 V
C94,95	2113741B69	0.1 uF, +/-5%; 50 V
C97 thru 99	2113740A29	10 pF, +/-5%; 50 V
C100	2311049A08	1 uF, +/-10%; 35 V
C101 thru 103	2113741B69	0.1 uF, +/-5%; 50 V
C104	2113740A55	100 pF, +/-5%; 50 V
C105	2113740A29	10 pF, +/-5%; 50 V
C108	2380090M36	CAP 100 UF 25V
C116	2113741A41	6800 pF, +/-5%; 50 V
C117	2113741B67	0.082 uF, +/-5%; 50V
C118	2113741F01	100 pF, +/-5%; 50V
COIL, INDUCTOR: 6.8 UH		
L5,6	2411087B36	
CONNECTOR, PLUG: PLUG, EUROCARD 96 PIN R A		
P4	2883562R04	
TRANSISTOR: (SEE NOTE) NPN		
Q1,2	4813822A07	
RESISTOR, FIXED: +/-5%; 1/16 W: UNLESS OTHERWISE STATED		
R1	0611079D51	RES CHIP 332.0 1/10W 1%
R2	0611079D18	RES CHIP 150.0 1/10W 1%
R3	0611079D89	RES CHIP 825.0 1/10W 1%
R4,5	0662057A25	CHIP RES 100 OHMS
R6,7	0611079A01	O ohms, 1/10 W
R8	0611079D89	RES CHIP 825.0 1/10W 1%
R9	0611079D93	909 ohms, 1/10 W; +/-1%

TTN5066A 4-Wire Euro WIB

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R10	0662057A65	CHIP RES 4700 OHMS
R11,12	0662057A89	CHIP RES 47K OHMS
R15	0611079D58	RES CHIP 392.0 1/10W 1%
R17	0662057A65	CHIP RES 4700 OHMS
R18,19	0662057A80	CHIP RES 20K OHMS
R20,21	0611079G01	10k, +/-1%; 1/10 W
R22	0611079G49	31.6K, 1/10W; +/-1%
R23	0611079G09	12.1K, 1/10 W; +/-1%
R30	0611079G49	31.6K, 1/10W; +/-1%
R31	0611079G09	12.1K, 1/10 W; +/-1%
R32	0611079G49	31.6K, 1/10W; +/-1%
R47	0611079F81	RES CHIP 6.81K 1/10W 1% 0805
R48	0611079B01	12K, 1/10 W
R50	0611079G11	12.7K, 1/10W; +/-1%
R51	0611079E09	Resistor: chip 121.0K 1/10 W 1%
R52	0611079G01	10k, +/-1%; 1/10 W
R53	0611079G11	12.7K, 1/10W; +/-1%
R54	0611079G49	31.6K, 1/10W; +/-1%
R55	0611079G09	12.1K, 1/10 W; +/-1%
R56	0611079G17	RES CHIP 14.7K 1/10W 1% 0805
R59	0662057A97	CHIP RES 100K OHMS
R61	0662057A73	CHIP RES 10K OHMS
R74,75	0611079D81	RES CHIP 681.0 1/10W 1%
R76	0611079D51	RES CHIP 332.0 1/10W 1%
R77	0611079D18	RES CHIP 150.0 1/10W 1%
R78,79	0611079D89	RES CHIP 825.0 1/10W 1%
R80	0611079D93	909 ohms, 1/10 W; +/-1%
R81	0611079D58	RES CHIP 392.0 1/10W 1%
R89,90	0611079D81	RES CHIP 681.0 1/10W 1%
R92,93	0662057A57	CHIP RES 2200 OHMS
R94	0662057A61	CHIP RES 3300 OHMS
R98	0611079G87	Resistor chip 78.7K 1/10 W 1%
R99 thru 101	0662057A45	CHIP RES 680 OHMS
R102	0662057A73	CHIP RES 10K OHMS
R105	0662057A67	CHIP RES 5600 OHMS
R106	0662057A75	CHIP RES 12K OHMS
R107,108	0662057A45	CHIP RES 680 OHMS
R109	0611079G87	Resistor chip 78.7K 1/10 W 1%
R110,111	0611079E30	200K, 1/10 W; +/-1%
R112,113	0682527W01	VARIATOR SILICON OXIDE
R133	0662057A51	CHIP RES 1200 OHMS
R134	0662057A81	CHIP RES 22K OHMS
R136	0662057A45	CHIP RES 680 OHMS
R138	0662057B66	CHIP RES 5.6 OHMS
SWITCH: POLY SWITCH C.M.		
SW1 thru 4	0683408X01	
TRANSFORMER: XFMR LINE MATCHING		
T1,2	2584422T02	
SPARK GAP: (SEE NOTE) SRGE SUPPRESSOR, GLASSBY, 230V		
TV1 thru 4	8083379X01	
INTEGRATED CIRCUIT: (SEE NOTE) Quad Operational Amplifier High Performance, Single Supply Quad Operational Amplifier Mux/Demux, Trip 2-Channel Analog Quad Analog Multiplexer/Demultiplexer CODEC Pulse Code Modulation IC 8 BIT SER TO PAR/PAR HC595 5-Volt Positive Regulator Quad Analog Multiplexer/Demultiplexer		
U1	5113819A04	
U2	5113819A05	
U3	5113819A04	
U4	5113805A85	
U5	5113805A86	
U10	5184743T01	
U11	5113805A75	
U12	5113816A07	
U13	5113805A86	
DIODE ZENER: (SEE NOTE) Zener, 3.3 V 0.1A, 70 V		
VR1,2	4813830A09	
VR3,4	4813833C10	
NON-REFERENCED ITEMS Shorting Jumper: 2-contact (used with P1) Shorting Jumper: 2-contact (used with P3) Shorting Jumper: 2-contact (used with P5) Shorting Jumper: 2-contact (used with P7) Shorting Jumper: 2-contact (used with P8)		
	0984728L01	
	0984728L01	
	0984728L01	
	0984728L01	
	0984728L01	

TTN5066A 4-Wire Euro WIB

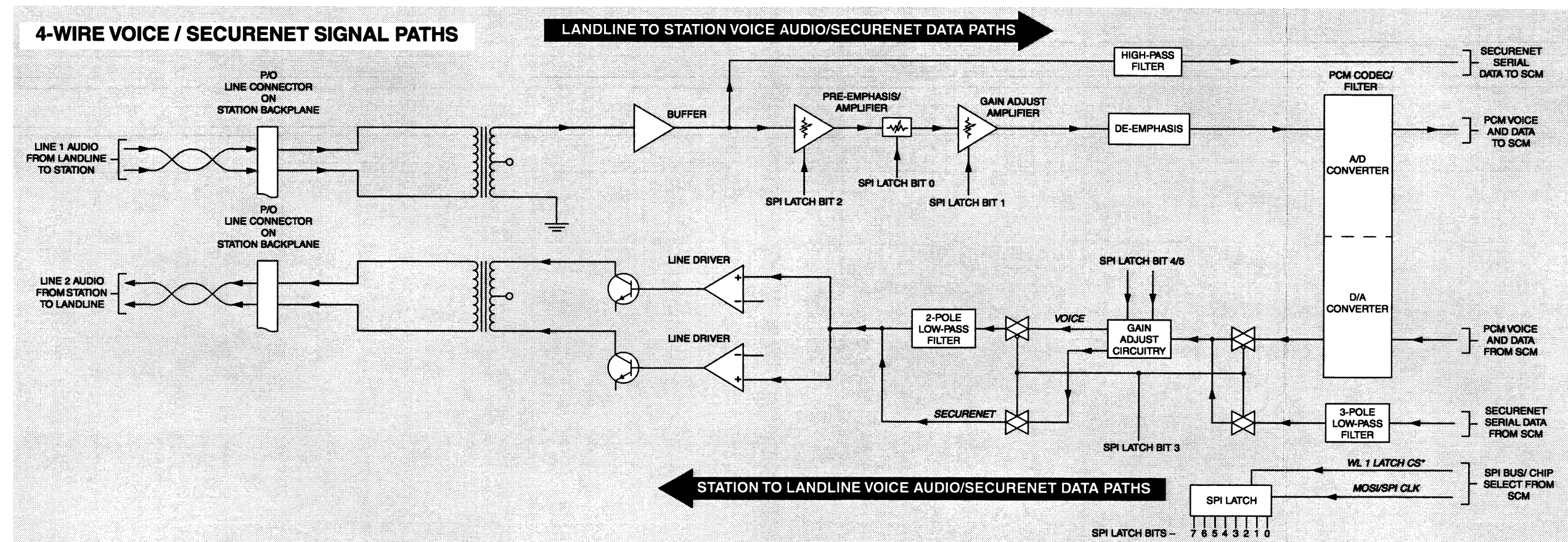
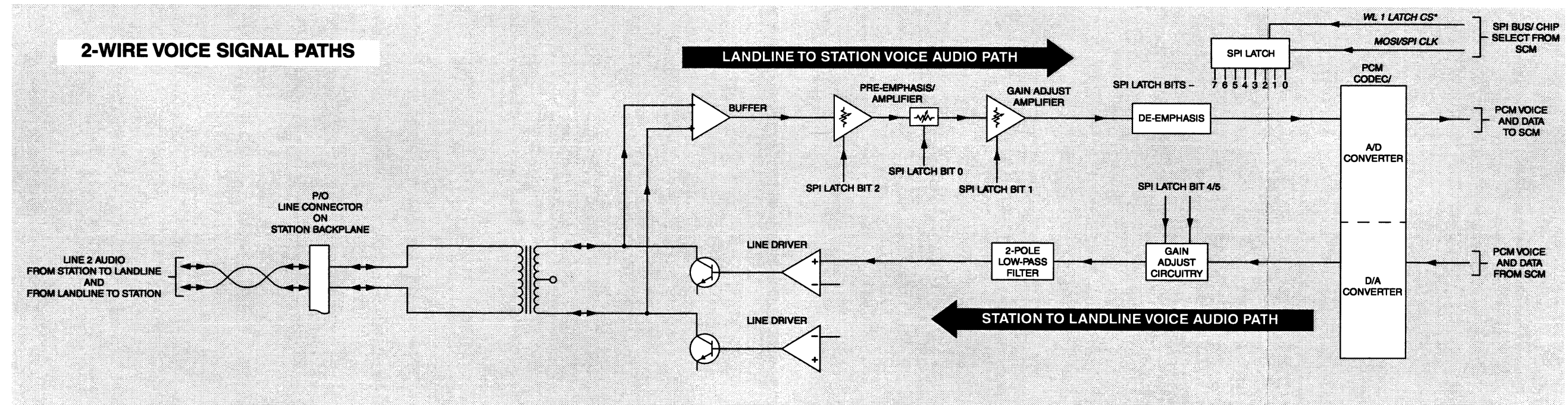
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	0984728L01	Shorting Jumper: 2-contact (used with P9)
	2880001R02	plug: 2-pin header (used with P3)
	2880001R02	plug: 2-pin header (used with P7)
	2880001S05	plug: 10-contact (used with P1)
	2880001S05	plug: 10-contact (used with P5)
	2880001S05	plug: 10-contact (used with P8)
	2880001S05	plug: 10-contact (used with P9)

Note: For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

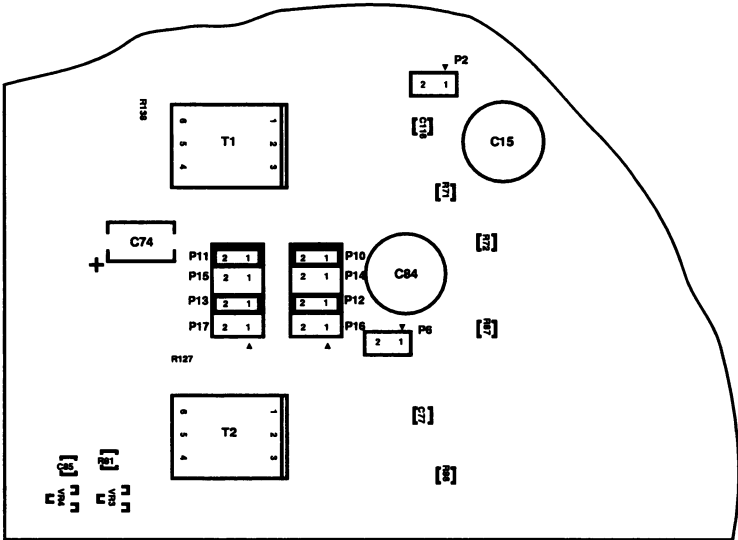
TTN5066A 4-Wire Euro WIB

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
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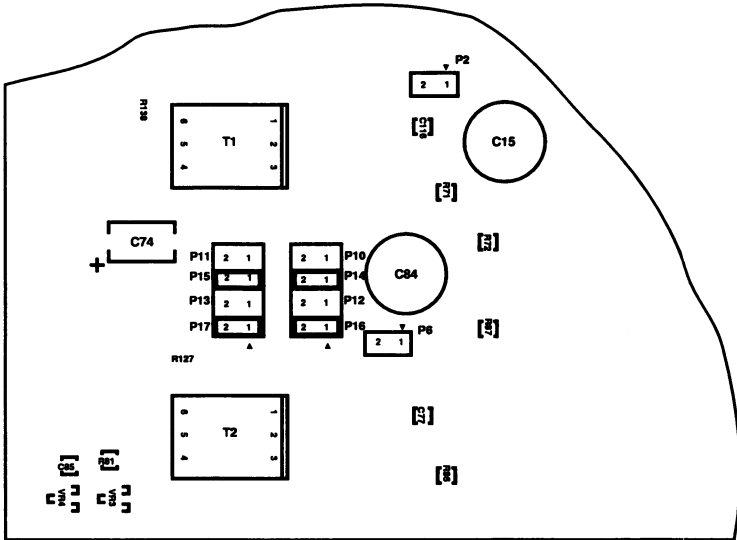
4-WIRE WIB MODULE MODEL TTN5067A



4-WIRE WIB MODULE
MODEL TTN5067A



DC Remote Control 4-Wire Configuration



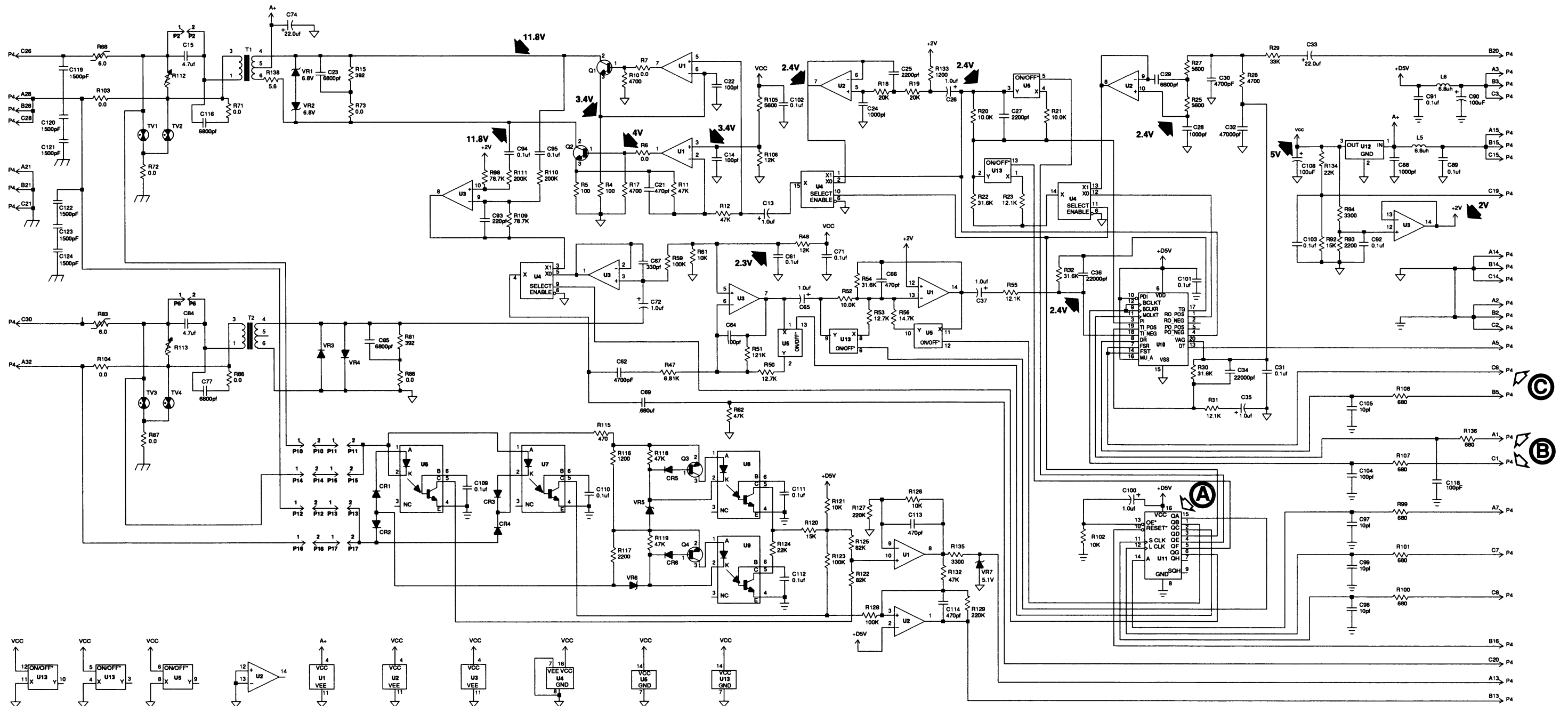
DC Remote Control 2-Wire Configuration

Remote Control Type	P10, P11	P12, P13	P14, P15	P16, P17
DC Remote Control 2-wire configuration	out	out	in	in
DC Remote Control 4-wire configuration	in	in	out	out
Tone or Binary Remote Control 2-wire/4-wire configurations	out			

Signal Path	Description/Nominal Signal Levels
A	The SPI LATCH U11 is used to configure the WIB by means of several MUXs and Analog switches. The output pins 1 to 6 and pin 15 drive the select inputs of the configuration path switches and amplification step switches. On the TTN 5068A (8-Wire) a second SPI Latch (U15) is used to configure the two additional paths in the same manner as above.
B	The continuous Master Clock and the Bit Clock are essential for the correct data transfer and data sampling. Both are square waves with the duty cycle 1:1 with a period of 3,9 usec.
C	The continuous Frame Sync Clock starts the PCM serial Block Transfer. The waveform is a needle pulse train with a repetition rate of 125 usec.

Configuration Mode	U11/Pin#	State (Volt)	Remarks
4-Wire Mode	6	0	
2-Wire Mode	6	5.1	Only active line is L2
Analog Voice Mode	3	0	
Broadband Mode (SECURENET)	3	5.1	

4-WIRE WIB MODULE MODEL TTN5067A

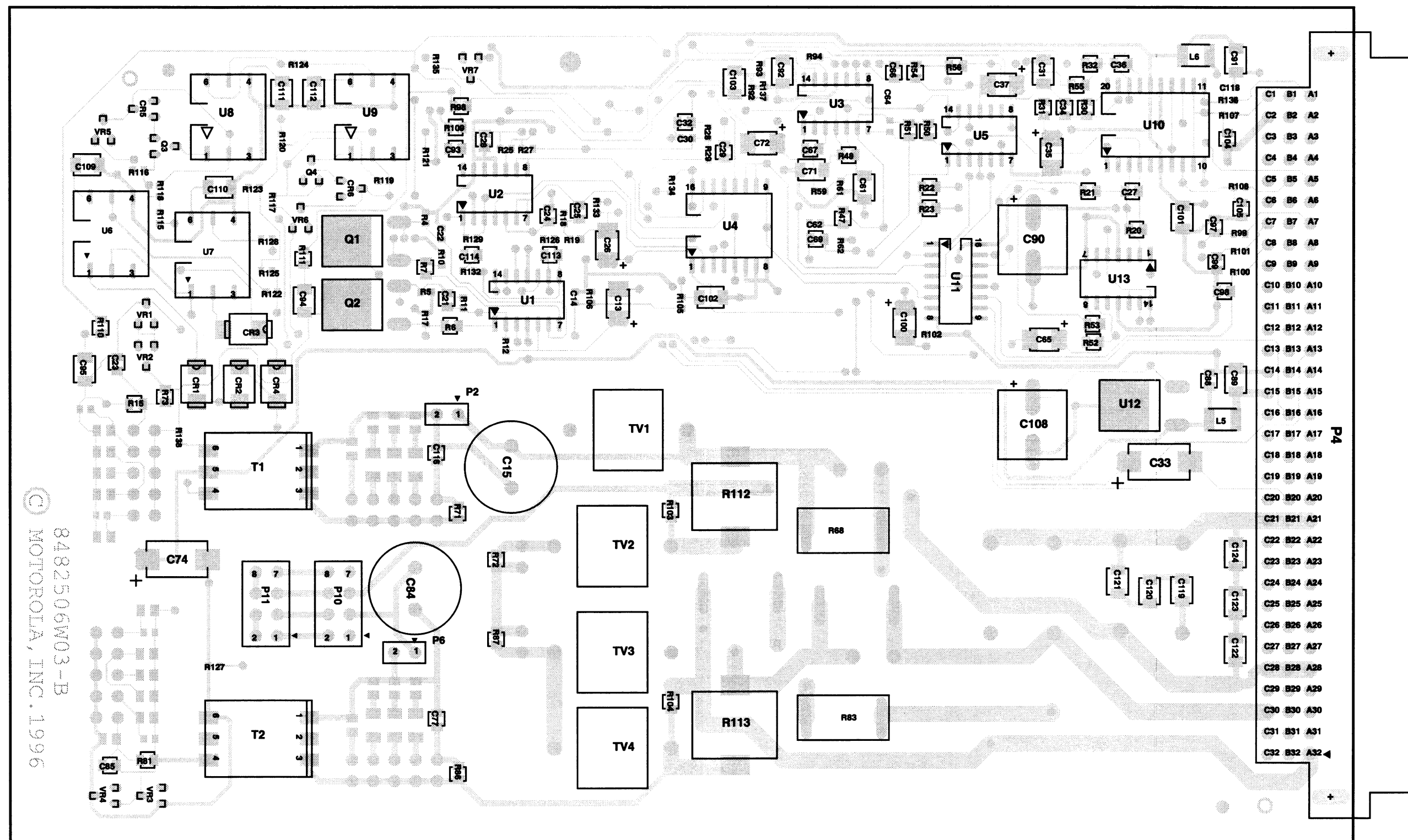


TTN5067A 4-WIRE VOICE AUDIO/SECURENET DATA PATH SCHEMATIC

4-WIRE WIB MODULE
MODEL TTN5067A

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4-WIRE WIB MODULE MODEL TTN5067A



TTN5067A 4-WIRE VOICE AUDIO/SECURENET DATA BOARD DETAIL

4-WIRE WIB MODULE
MODEL TTN5067A

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Parts List

TTN5067A 4-Wire WIB With DC Remote

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
CAPACITOR, FIXED: UF +/-10%; 100 V:		
UNLESS OTHERWISE STATED		
C13	2311049A08	1 uF, +/-10%; 35 V
C14	2113740F51	100 pF, +/-5%; 50V
C15	2382174V01	4.7 uF, +/-20%; 200 V
C21	2113740A71	470 pF, +/-5%; 50 V
C22	2113740F51	100 pF, +/-5%; 50V
C23	2113741A41	6800 pF, +/-5%; 50 V
C24	2113740A79	1000 pF, +/-5%; 50 V
C25	2113741A29	2200 pF, +/-5%; 50 V
C26	2311049A08	1 uF, +/-10%; 35 V
C27	2113741A29	2200 pF, +/-5%; 50 V
C28	2113740A79	1000 pF, +/-5%; 50 V
C29	2113741A41	6800 pF, +/-5%; 50 V
C30	2113741F41	4700 pF, +/-5%; 50V
C31	2113741B69	0.1 uF, +/-5%; 50 V
C32	2113741A61	0.047 uF, +/-5%; 50 V
C33	2311049A21	22 uF, +/-10%; 20 V
C34	2113741A53	0.022 uF, +/-5%; 50 V
C35	2311049A08	1 uF, +/-10%; 35 V
C36	2113741A53	0.022 uF, +/-5%; 50 V
C37	2311049A08	1 uF, +/-10%; 35 V
C61	2113741B69	0.1 uF, +/-5%; 50 V
C62	2113741F41	4700 pF, +/-5%; 50V
C64	2113740F51	100 pF, +/-5%; 50V
C65	2311049A08	1 uF, +/-10%; 35 V
C66	2113740A71	470 pF, +/-5%; 50 V
C67	2113740A67	330 pF, +/-5%; 50 V
C69	2113743F15	CAP CHIP .680 UF 16V +80-20%
C71	2113741B69	0.1 uF, +/-5%; 50 V
C72	2311049A08	1 uF, +/-10%; 35 V
C74	2311049A21	22 uF, +/-10%; 20 V
C77	2113741A41	6800 pF, +/-5%; 50 V
C84	2382174V01	4.7 uF, +/-20%; 200 V
C85	2113741A41	6800 pF, +/-5%; 50 V
C88	2113740A79	1000 pF, +/-5%; 50 V
C89	2113741B69	0.1 uF, +/-5%; 50 V
C90	2380090M36	CAP 100 UF 25V
C91,92	2113741B69	0.1 uF, +/-5%; 50 V
C93	2113740A63	220 pF, +/-5%; 50 V
C94,95	2113741B69	0.1 uF, +/-5%; 50 V
C97 thru 99	2113740A29	10 pF, +/-5%; 50 V
C100	2311049A08	1 uF, +/-10%; 35 V
C101 thru 103	2113741B69	0.1 uF, +/-5%; 50 V
C104	2113740A55	100 pF, +/-5%; 50 V
C105	2113740A29	10 pF, +/-5%; 50 V
C108	2380090M36	CAP 100 UF 25V
C109 thru 112	2113741B69	0.1 uF, +/-5%; 50 V
C113,114	2113740A71	470 pF, +/-5%; 50 V
C116	2113741A41	6800 pF, +/-5%; 50 V
C118	2113741F01	100 pF, +/-5%; 50V
C119 thru 124	2113918A11	CAP CHIP 1500PF 1000V 20% X7R
DIODE: (SEE NOTE)		
CR1 thru 4	4813833B06	1A; 600 V
CR5,6	4813833C10	0.1A, 70 V
INDUCTOR, VARIABLE:		
L5,6	2411087B36	6.8 UH
CONNECTOR, PLUG:		
P4	2883562R04	PLUG, EUROCARD 96 PIN R A
TRANSISTOR: (SEE NOTE)		
Q1,2	4813822A07	NPN
Q3,4	4813824A18	PNP
RESISTOR, FIXED: +/-5%; 1/4 W:		
UNLESS OTHERWISE STATED		
R4,5	0662057A25	CHIP RES 100 OHMS 5%
R6,7	0611079A01	O ohms, +/-5%; 1/10 W
R10	0662057A65	CHIP RES 4700 OHMS 5%
R11,12	0662057A89	CHIP RES 47K OHMS 5%
R15	0611079D58	RES CHIP 392.0 1/10W 1%
R17	0662057A65	CHIP RES 4700 OHMS 5%
R18,19	0662057A80	CHIP RES 20K OHMS 5%
R20,21	0611079G01	10k, +/-1%; 1/10 W
R22	0611079G49	31.6K, 1/10W; +/-1%
R23	0611079G09	12.1K, 1/10 W; +/-1%
R25	0662057A67	CHIP RES 5600 OHMS 5%
R27	0662057A67	CHIP RES 5600 OHMS 5%

TTN5067A 4-Wire WIB With DC Remote

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R28	0662057A65	CHIP RES 4700 OHMS 5%
R29	0662057A85	CHIP RES 33K OHMS 5%
R30	0611079G49	31.6K, 1/10W; +/-1%
R31	0611079G09	12.1K, 1/10 W; +/-1%
R32	0611079G49	31.6K, 1/10W; +/-1%
R47	0611079F81	RES CHIP 6.81K 1/10W 1% 0805
R48	0611079B01	12K, +/-5%; 1/10 W
R50	0611079G11	12.7K, 1/10W; +/-1%
R51	0611079E09	Resistor: chip 121.0K 1/10 W 1%
R52	0611079G01	10k, +/-1%; 1/10 W
R53	0611079G11	12.7K, 1/10W; +/-1%
R54	0611079G49	31.6K, 1/10W; +/-1%
R55	0611079G09	12.1K, 1/10 W; +/-1%
R56	0611079G17	RES CHIP 14.7K 1/10W 1% 0805
R59	0662057A97	CHIP RES 100K OHMS 5%
R61	0662057A73	CHIP RES 10K OHMS 5%
R62	0662057A89	CHIP RES 47K OHMS 5%
R68	0685239U03	RES. PTC 600V .145 HT
R71 thru 73	0611079A01	O ohms, +/-5%; 1/10 W
R81	0611079D58	RES CHIP 392.0 1/10W 1%
R83	0685239U03	RES. PTC 600V .145 HT
R86 thru 88	0611079A01	O ohms, +/-5%; 1/10 W
R92	0662057A77	CHIP RES 15K OHMS 5%
R93	0662057A57	CHIP RES 2200 OHMS 5%
R94	0662057A61	CHIP RES 3300 OHMS 5%
R98	0611079G87	Resistor chip 78.7K 1/10 W 1%
R99 thru 101	0662057A45	CHIP RES 680 OHMS 5%
R102	0662057A73	CHIP RES 10K OHMS 5%
R103,104	0611079A01	O ohms, +/-5%; 1/10 W
R105	0662057A67	CHIP RES 5600 OHMS 5%
R106	0662057A75	CHIP RES 12K OHMS 5%
R107,108	0662057A45	CHIP RES 680 OHMS 5%
R109	0611079G87	Resistor chip 78.7K 1/10 W 1%
R110,111	0611079E30	200K, 1/10 W; +/-1%
R112,113	0682527W01	VARISTOR SILICON OXIDE
R115	0662057A41	CHIP RES 470 OHMS 5%
R116	0662057A51	CHIP RES 1200 OHMS 5%
R117	0662057A57	CHIP RES 2200 OHMS 5%
R118,119	0662057A89	CHIP RES 47K OHMS 5%
R120	0662057A77	CHIP RES 15K OHMS 5%
R121	0662057A73	CHIP RES 10K OHMS 5%
R122	0662057A95	CHIP RES 82K OHMS 5%
R123	0662057A97	CHIP RES 100K OHMS 5%
R124	0662057A81	CHIP RES 22K OHMS 5%
R125	0662057A95	CHIP RES 82K OHMS 5%
R126	0662057A73	CHIP RES 10K OHMS 5%
R127	0662057B06	CHIP RES 220K OHMS 5%
R128	0662057A97	CHIP RES 100K OHMS 5%
R129	0662057B06	CHIP RES 220K OHMS 5%
R132	0662057A89	CHIP RES 47K OHMS 5%
R133	0662057A51	CHIP RES 1200 OHMS 5%
R134	0662057A81	CHIP RES 22K OHMS 5%
R135	0662057A61	CHIP RES 3300 OHMS 5%
R136	0662057A45	CHIP RES 680 OHMS 5%
R138	0662057B66	CHIP RES 5.6 OHMS
TRANSFORMER:		
T1,2	2584422T02	XFMR LIME MATCHING
SPARK GAP: (SEE NOTE)		
TV1 thru 4	8083379X01	SRGE SUPPRESSOR, GLASSBY, 230V
INTEGRATED CIRCUIT: (SEE NOTE)		
U1	5113819A04	Quad Operational Amplifier
U2	5113819A05	High Performance, Single Supply
U3	5113819A04	Quad Operational Amplifier
U4	5113805A85	Mux/Demux, Trip 2-Channel Analog
U5	5113805A86	Quad Analog Multiplexer/Demultiplexer
U6 thru 9	5184742T03	OPTOISOLATOR
U10	5184743T01	CODEC Pulse Code Modulation
U11	5113805A75	IC 8 BIT SER TO PAR/PAR HC595
U12	5113816A07	5-Volt Positive Regulator
U13	5113805A86	Quad Analog Multiplexer/Demultiplexer
VOLTAGE REGULATOR: (SEE NOTE)		
VR1,2	4813830A18	Zener, 6.8 V
VR3,4	4813833C10	0.1A, 70 V
VR5	4813830A20	8.2V +/-5%; 20 mA 350 mW
VR6	4813830A18	Zener, 6.8V
VR7	4813830A14	Zener, 5.1 V

TTN5067A 4-Wire WIB With DC Remote

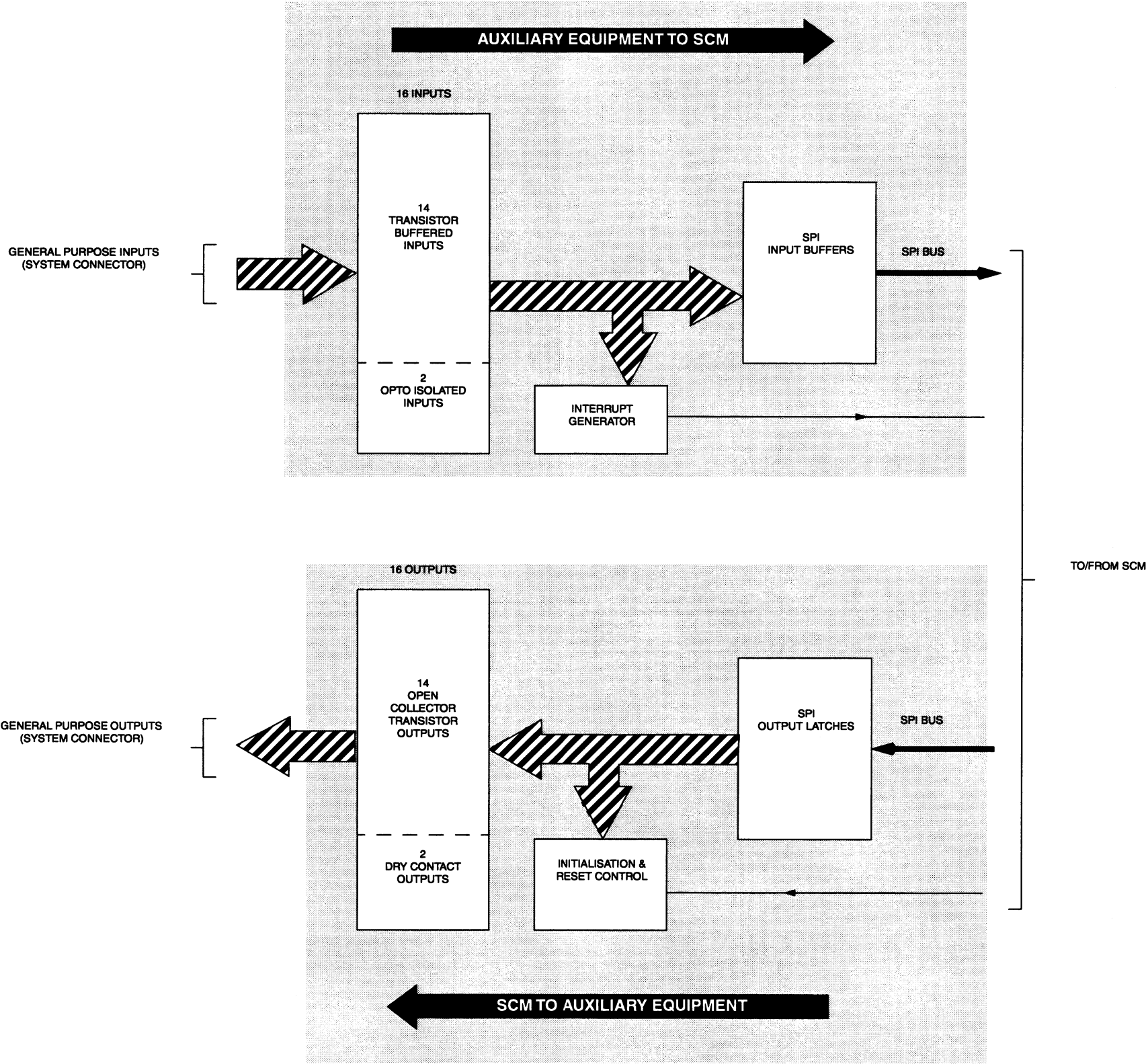
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
NON-REFERENCED ITEMS		
	0984728L01	Shorting Jumper: 2-contact (used with P2)
	0984728L01	Shorting Jumper: 2-contact (used with P6)
	0984728L01	Shorting Jumper: 2-contact (used with P10)
	0984728L01	Shorting Jumper: 2-contact (used with P11)
	2880001R02	plug: 2-pin header (used with P2)
	2880001R02	plug: 2-pin header (used with P6)
	2880001S04	plug: 8-contact (used with P10)
	2880001S04	plug: 8-contact (used with P11)

Note: For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.

TTN5067A 4-Wire WIB With DC Remote

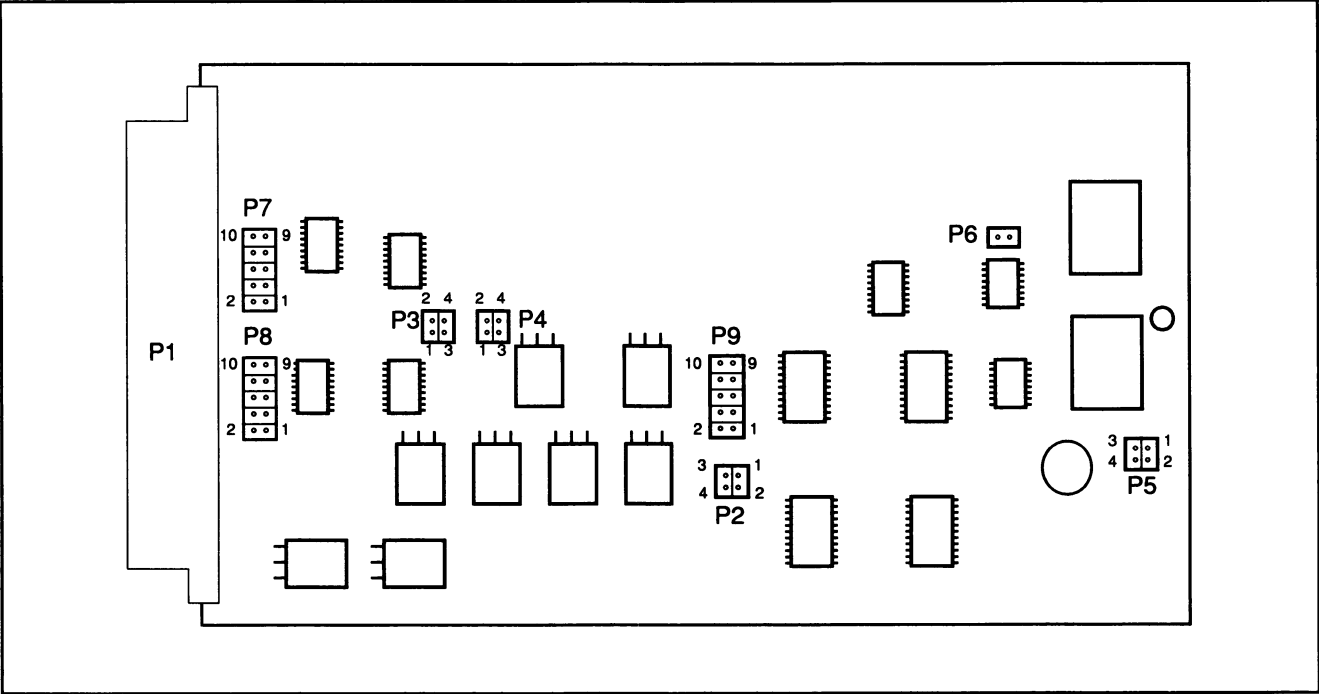
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
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AUXILIARY I/O MODULE
MODEL CLN6698A



AUXILIARY I/O FUNCTIONAL BLOCK DIAGRAM

AUXILIARY I/O MODULE
MODEL CLN6698A



AUXILIARY I/O BOARD JUMPERS

Jumpers are provided to route inputs and outputs in a specific direction to and from the SCM; the SCM determines the functionality of the inputs and outputs.

The board jumpers are shown in the figure above.

GPI_14 is a special input which can be jumpered to be a transistor input or opto isolated.

In addition it can be dedicated to the Ext_PTT* Line routed to the SCM. This function is a fast external PTT* (an active low function).

The board jumper settings for P2, P9, P6 are provided in Table 1. Settings for P5 are provided in Table 2. Settings for P3, P4 are provided in Table 3.

The five optional jumper position of P7 are used for additional connection of General Purpose Outputs if all General Purpose Inputs are not in use. Table 4 shows the jumper settings provided by P7. P8 is not used.

Table 1. Configuring Input GPI_14 Function

Function on GPI_14	Input Type	System Connector Input Pins	Auxiliary I/O Board Jumpers		
			P2	P9	P6 (See Note 1)
Fast External PTT*	via Optocoupler (E/M sub). (See Note 2)	C4 Opto + C7 Opto -	3 - 4, 1 - 2		In
	via Transistor	B7		9 - 10, 7 - 8	In
Fast External PTT	via Optocoupler (E/M sub)	C4 Opto + C7 Opto -	3 - 4, 1 - 2		Out
	via Transistor	B7		9 - 10, 7 - 8	Out

Table 2. Configuring Output GPO_14 Function

Function on GPO_14	Output Type	System Connector Output Pins	Auxiliary I/O Board Jumper P5
AC Fail	via Relay Closure	B4, C3	2 - 4
SPI Latch for GPO_14 (software defined)	via Relay Closure	B4, C3	1 - 2

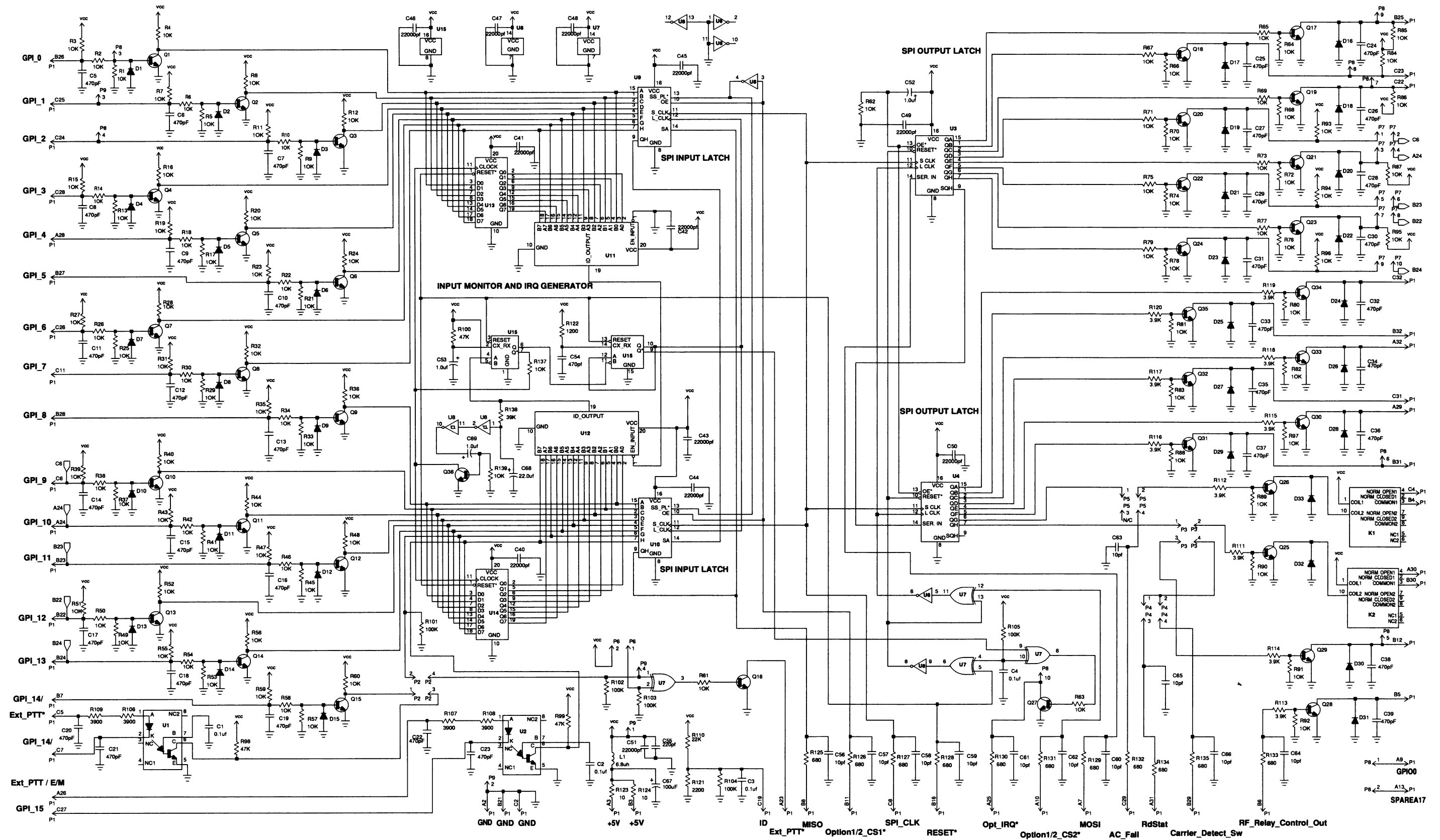
Table 3. Configuring Output GPO_15 Function

Function on GPO_15	Output Type	System Connector Output Pins	Auxiliary I/O Board Jumpers	
			P3	P4
Fast Carrier Detect	via Relay Closure	A30, B30	2 - 4	2 - 4
	via Open Collector	B12 (see Note 4)	3 - 4	2 - 4
RdStat	via Relay Closure (see Note 3)	A30, B30	2 - 4	1 - 3
	via Open Collector	B12 (see Note 4)	3, 4	1, 3
SPI Latch for GPO_15 (software defined)	via Relay Closure	A30, B30	1 - 2	
	via Open Collector	B12 (see Note 4)	1 - 3	

Table 4. Configuring Additional GPOs

Configured GPO Assignment	GPI Assignment	System Connector Pin	Auxiliary I/O Board Jumper P7
GPO_3	GIP_9	C5	1 - 2
GPO_4	GPI_10	C12	3 - 4
GPO_5	GPI_11	B12	5 - 6
GPO_6	GPI_12	B11	7 - 8
GPO_7	GPI_13	B9	9 - 10

AUXILIARY I/O MODULE MODEL CLN6698A

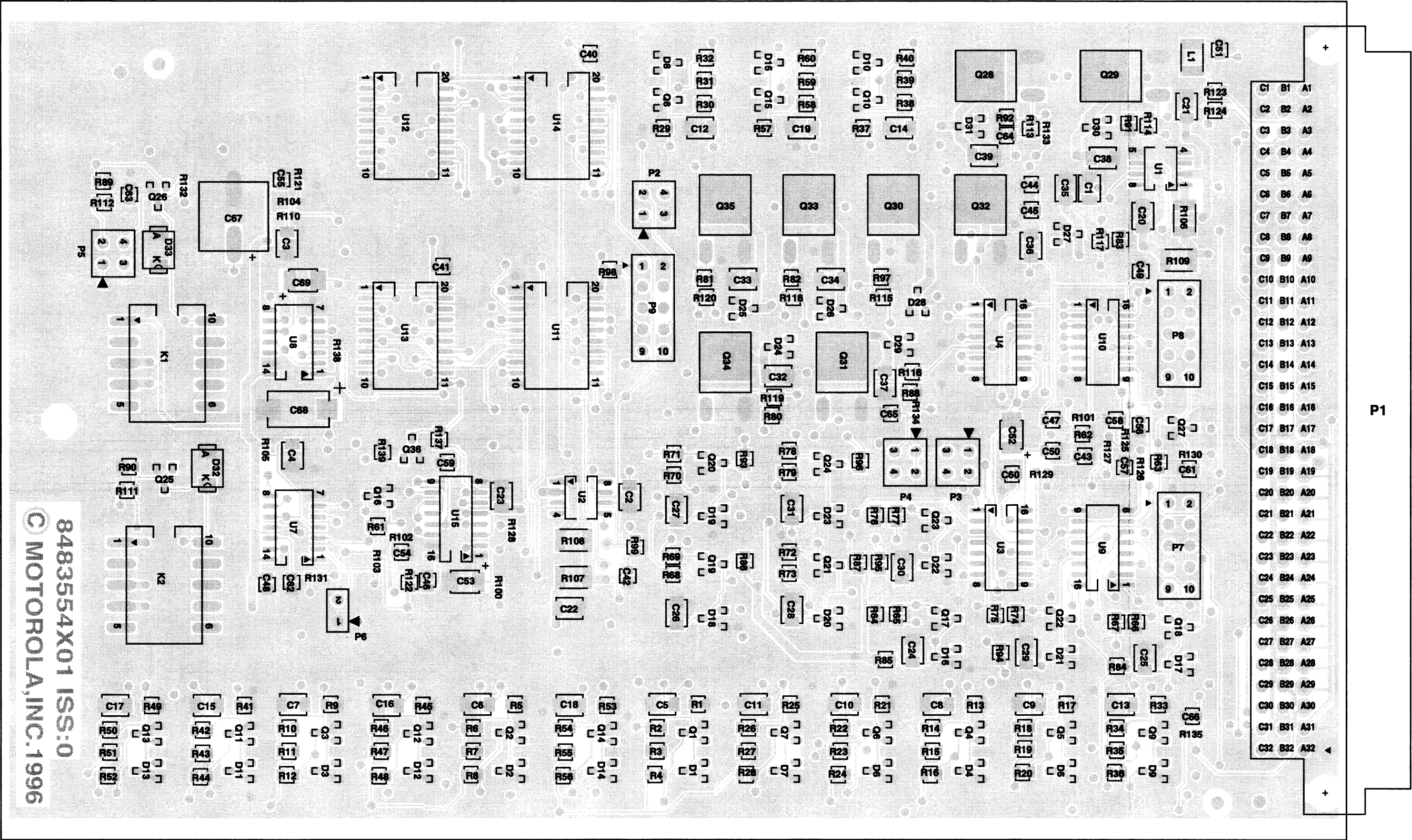


CLN6698A AUXILIARY I/O BOARD SCHEMATIC

AUXILIARY I/O MODULE
MODEL CLN6698A

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AUXILIARY I/O MODULE
MODEL CLN6698A



CLN6698A AUXILIARY I/O BOARD DETAIL

AUXILIARY I/O MODULE
MODEL CLN6698A

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Parts List

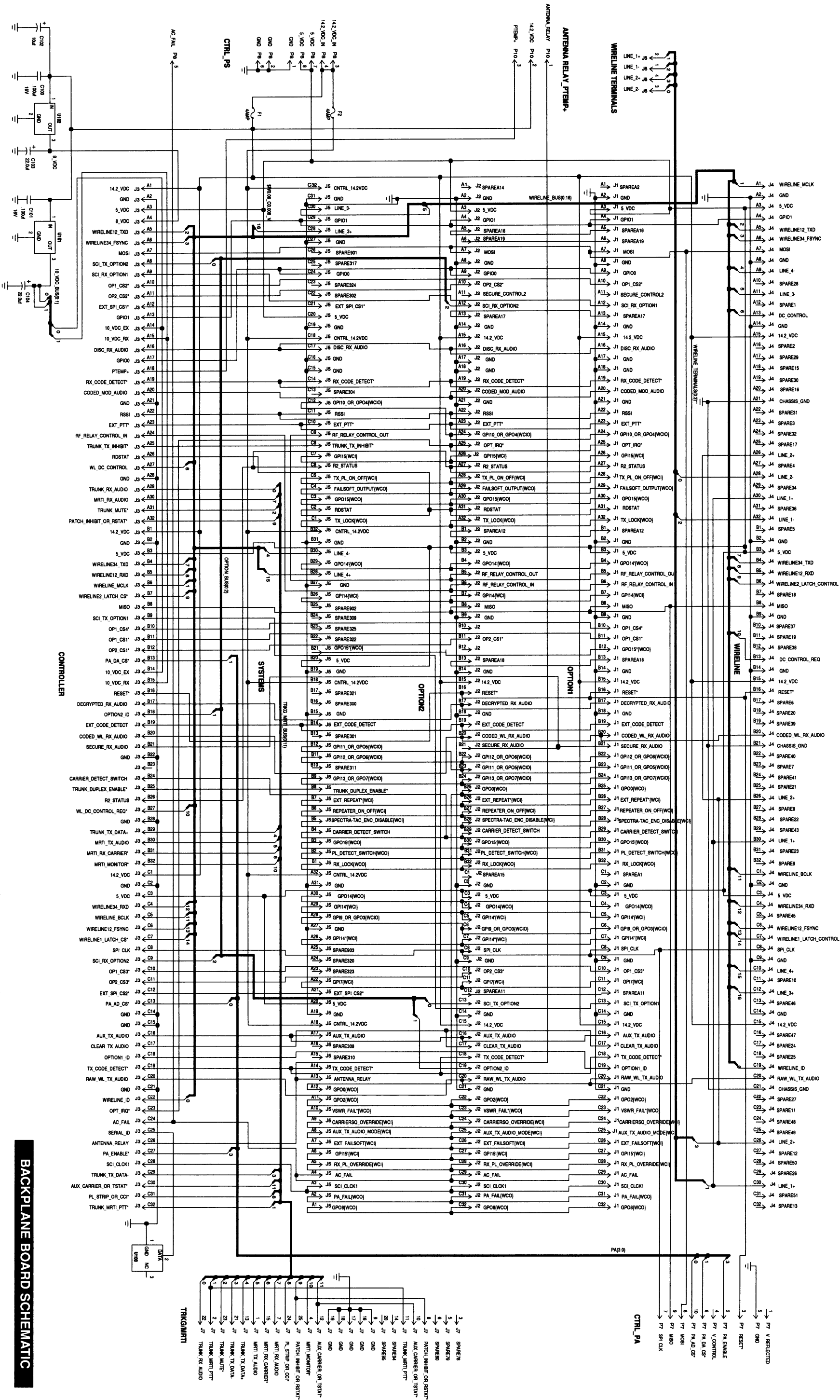
CLN6698A AUXILIARY I/O BOARD

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
CAPACITOR, FIXED: UF +/-10%; 100 V:		
UNLESS OTHERWISE STATED		
C1 thru 4	2113741B69	0.1 uF, +/-5%; 50 V
C5 thru 39	2113918A05	470 pF, +/-20%; 1000 V
C40 thru 51	2113741A53	0.022 uF, +/-5%; 50 V
C52,53	2311049A08	1 uF, +/-10%; 35 V
C54	2113741A57	0.033 uF, +/-5%; 50 V
C55	2113740A63	220 pF, +/-5%; 50 V
C56 thru 66	2113740A29	10 pF, +/-5%; 50 V
C67	2380090M36	CAP 100 UF 25V
C68	2311049A21	22 uF, +/-10%; 20 V
C69	2311049A08	1 uF, +/-10%; 35 V
DIODE: (SEE NOTE)		
D1 thru 31	4813833C10	0.1A, 70 V
D32,33	4813833B01	Schottky type
RELAY:		
K1,2	8013917B01	5 V, 330 ohm
COIL, INDUCTOR:		
L1	2411087B36	6.8 UH
CONNECTOR, PLUG:		
P1	2883562R04	PLUG, EUROCARD 96 PIN R A
P7 thru 9	2880001S05	plug: 10-contact
TRANSISTOR: (SEE NOTE)		
Q1 thru 27	4813824A11	NPN
Q28 thru 35	4813822A07	NPN
Q36	4813824A11	NPN
RESISTOR, FIXED: +/-5%; 1/16 W:		
UNLESS OTHERWISE STATED		
R1 thru 97	0611079A98	10K, 1/10 W
R98,99	0611079A94	6800 ohms,1/10 W
R100	0662057A89	CHIP RES 47K OHMS
R101 thru 105	0662057A97	CHIP RES 100K OHMS
R106 thru 109	0611072A63	3900 ohms, 1/4W
R110	0662057A81	CHIP RES 22K OHMS
R111 thru 120	0611079A88	3900 ohms, 1/10 W
R121	0662057A57	CHIP RES 2200 OHMS
R122	0611079A98	10K, 1/10 W
R123,124	0611079A26	10 ohms, 1/10 W
R125 thru 135	0662057A45	CHIP RES 680 OHMS
R137	0611079A98	10K, 1/10 W
R138	0662057A87	CHIP RES 39K OHMS
R139	0611079A98	10K, 1/10 W
INTEGRATED CIRCUIT: (SEE NOTE)		
U1,2	5184742T01	OPTOISOLATOR
U3,4	5113805A75	IC 8 BIT SER TO PAR/PAR HC595
U7	5113805A22	Quad 2-Input Exclusive OR Gate
U8	5113805A09	Schmit Trigger Hex Inverter
U9,10	5113805A74	IC; 8-bit register
U11,12	5113807A37	IC OCTAL COMPARATOR
U13,14	5113805A60	Octal D, Flip-Flop
U15	5113805A89	Monostable Multivibrator, Dual Precision
NON-REFERENCED ITEMS		
0984728L01		Shorting Jumper: 2-contact (2 used with P2)
0984728L01		Shorting Jumper: 2-contact (used with P3)
0984728L01		Shorting Jumper: 2-contact (used with P4)
0984728L01		Shorting Jumper: 2-contact (used with P5)
0984728L01		Shorting Jumper: 2-contact (used with P6)
2880001R02		plug: 2-pin header (used with P6)
2880001S02		CON PCB HDR 1 GOLD DR ST 4 POS (used with P2)
2880001S02		CON PCB HDR 1 GOLD DR ST 4 POS (used with P3)
2880001S02		CON PCB HDR 1 GOLD DR ST 4 POS (used with P4)
2880001S02		CON PCB HDR 1 GOLD DR ST 4 POS (used with P5)

CLN6698A AUXILIARY I/O BOARD

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
Note: For optimum performance, transistors, integrated circuits, and crystals must be ordered by Motorola part number.		

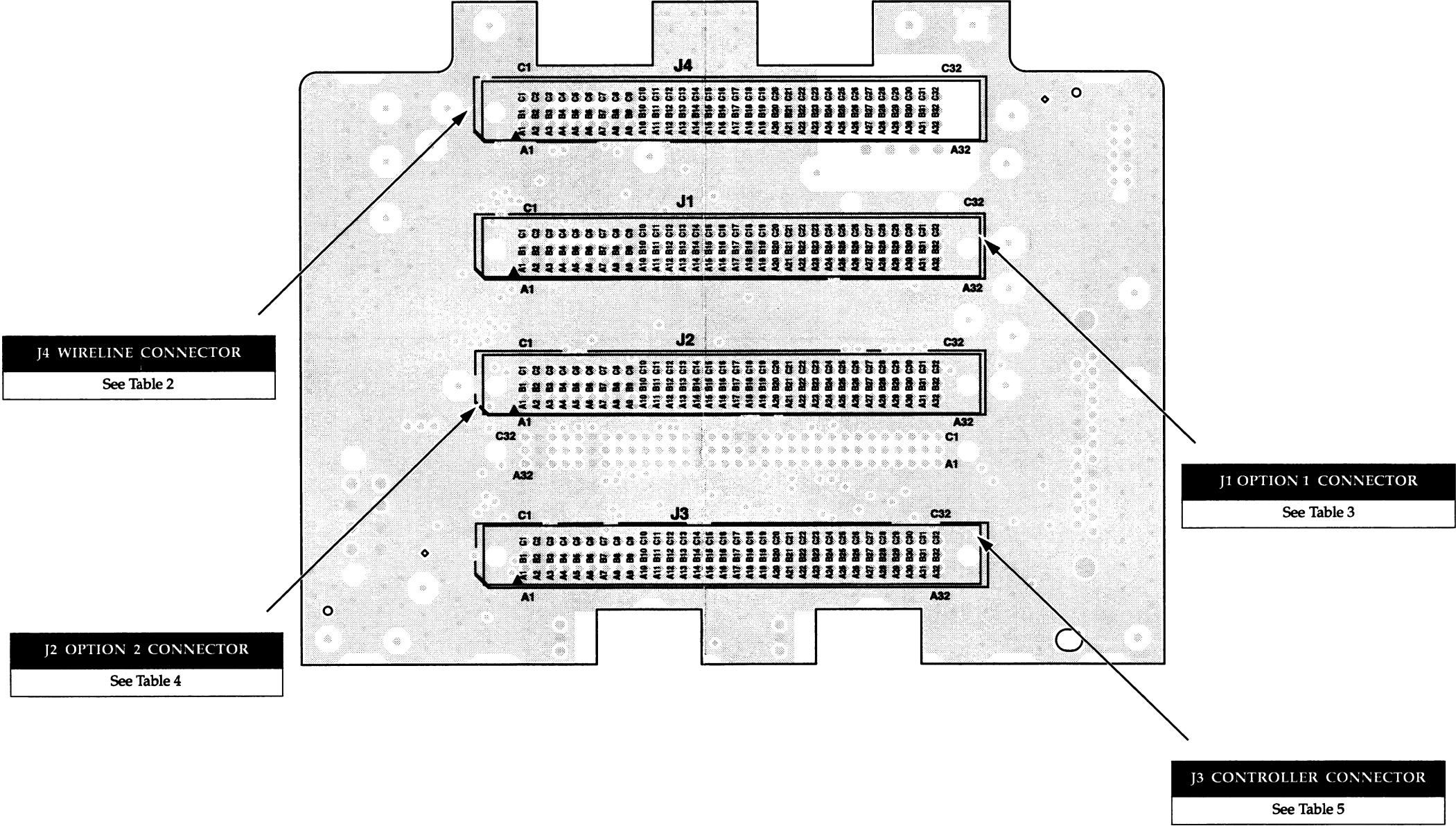
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BACKPLANE BOARD DETAIL INSIDE VIEW

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Table 1. J5 SYSTEM CONNECTOR									
Pin No.	Row A	Input/ Output	To/From	Row B	Input/ Output	To/From	Row C	Input/ Output	To/From
1	GPO_8 (WCO)	O	J1-C32, J2-C32	RX Lock (WCO)	O	J1-B32, J2-B32	TX Lock (WCO)	O	J1-A32, J2-A32
2	PA Fail (WCO)	O	J1-C31, J2-C31	PL Detect Switch (WCO)	O	J1-B31, J2-B31	Rdstat-R2 Control	O	J1-A31, J2-A31, J3-A26
3	SCI_CLKK1	O	J1-C30, J2-C30, J3-C28	GPO_15' (WCO)	O	J1-B30, J2-B30	GPO_15 (WCO)	O	J1-A30, J2-A30
4	AC Fail	I	P8-5, J1-C29, J2-C29, J3-C24	Carrier Detect Switch	O	J1-B29, J2-B29, J3-B24	Failsoft OUTPUT (WCO)	O	J1-A29, J2-A29
5	RX PL Override (WCI)	I	J1-C28, J2-C28	Spectra Tac Enc Disable (WCI)	I	J1-B28, J2-B28	TX PL On/Off (WCI)	I	J1-A28, J2-A28
6	GP1_15' (WCI)	I	J1-C27, J2-C27	Repeater ON/OFF (WCI)	I	J1-B27, J2-B27	RX Inhibit-R2 Status	I	J1-A27, J2-A27, J3-B26
7	Ext Failsoft (WCI)	I	J1-C26, J2-C26	Ext Repeat* (WCI)	I	J1-B26, J2-B26	GPI_15 (WCI)	I	J1-A26, J2-A26
8	Aux TX Audio Mode (WCI)	I	J1-C25, J2-C25	Trunk Duplex Enable*	O	J3-B25	Trunk TX Inhibit*	O	J3-A25
9	Carrier SQ Override (WCI)	I	J1-C24, J2-C24	GPI_13 or GPO_7 (WCIO)	I/O	J1-B24, J2-B24	RF Relay Control Out	O	J1-B5, J2-B5
10	VSWR_Fail* (WCO)	O	J1-C23, J2-C23	Spare 311	–	N/C	Ext PTT*	I	J1-A23, J2-A23, J3-A23
11	GPO_2 (WCO)	O	J1-C22, J2-C22	GPI_12 or GPO_6 (WCIO)	I/O	J1-B22, J2-B22	RSSI	O	J1-A22, J2-A22, J3-A22
12	GPO_0 (WCO)	O	J1-B25, J2-B25	GPI_11 or GPO_5 (WCIO)	I/O	J1-B23, J2-B23	GPI_10 or GPO_4 (WCIO)	I/O	J1-A24, J2-A24
13	Antenna Relay	O	P10-1, J3-C26	Spare 301	–	N/C	Spare 304	–	–
14	TX Code Detect*	O	J1-C18, J2-C18, J3-C19	Ext Code Detect	I	J1-B19, J2-B19, J3-B19	RX Code Detect*	O	J1-A19, J2-A19, J3-A19
15	Spare 310	–	–	GND	–	Station ground	GND	–	Station ground
16	Spare 308	–	–	Spare 300	–	–	GND	–	Station ground
17	Aux TX Audio	I	J1-C16, J2-C16, J3-C16	Spare 321	–	–	Disc RX Audio	O	J1-A16, J2-A16, J3-A16
18	Cntrl 14.2 VDC	O	P8 pins 3, 4 (thru F2)	Cntrl 14.2 VDC	O	P8 pins 3, 4 (thru F2)	Cntrl 14.2 VDC	O	P8 pins 3, 4 (thru F2)
19	GND	–	Station ground	GND	–	Station ground	GND	–	Station ground
20	5 VDC	O	P8 pins 7, 8	5 VDC	O	P8 pins 7, 8	5 VDC	O	P8 pins 7, 8
21	Ext SPI CS2*	O	J3-C12	GPO_15'' (WCO)	O	J1-B12	Ext SPI CS1*	O	J3-A12
22	GP1_7 (WCI)	I	J1-C11, J2-C11	Spare 322	–	–	Spare 302	–	–
23	Spare 323	–	–	Spare 325	–	–	Spare 324	–	–
24	Spare 320	–	–	Spare 309	–	–	GPIO_0 (CNTR I/O)	I/O	J1-A9, J2-A9, J3-A17
25	Spare 903	–	–	Spare 902	–	–	Spare 317	–	–
26	GP1_14'' (WCI)	I	J1-C7, J2-C7	GPI_14 (WCI)	I	J1-B7, J2-B7	Spare 901	–	–
27	GND	–	Station ground	GND	–	Station ground	GND	–	Station ground
28	GPI_9 or GPO_3 (WCIO)	I/O	J1-C6, J2-C6	Line 4+	O	J4-C10	Line 3+	I	J4-C12
29	GPI_14' (WCI)	I	J1-C5, J2-C5	GPO_14' (WCO)	O	J1-B4, J2-B4	GPIO_1 (CNTR I/O)	I/O	J1-A4, J2-A4, J3-A13
30	GPO_14 (WCO)	O	J1-C4, J2-C4	Line 4–	O	J4-A9	Line 3–	I	J4-A11
31	GND	–	Station ground	GND	–	Station ground	GND	–	Station ground
32	Cntrl 14.2 VDC	O	P8 pins 3, 4 (thru F2)	Cntrl 14.2 VDC	O	P8 pins 3, 4 (thru F2)	Cntrl 14.2 VDC	O	P8 pins 3, 4 (thru F2)

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Table 2. J4 WIRELINE CONNECTOR									
Pin No.	Row A	Input/ Output	To/From	Row B	Input/ Output	To/From	Row C	Input/ Output	To/From
1	Wireline MCLK	I	J3-B6	Spare 5	–	–	Wireline BCLK	I	J3-C5
2	GND	–	Station ground	GND	–	Station ground	GND	–	Station ground
3	5 VDC	I	P8 pins 7, 8	5 VDC	I	P8 pins 7, 8	5 VDC	I	P8 pins 7, 8
4	GPIO_1 (CNTR I/O)	I/O	J1-A4, J2-A4, J5-C29, J3-A13	Wireline 3/4 TXD	O	J3-B4	Wireline 3/4 RXD	I	J3-C4
5	Wireline 1/2 TXD	O	J3-A5	Wireline 1/2 RXD	I	J3-B5	Spare 45	–	–
6	Wireline 3/4 FSYNC	I	J3-A6	Wireline2 Latch CS*	I	J3-B7	Wireline 1/2 FSYNC	I	J3-C6
7	MOSI	I	P7-8, J1-A7, J2-A7, J3-A7	Spare 18	–	–	Wireline1 Latch CS*	I	J3-C7
8	GND	–	Station ground	MISO	O	J1-B8, J2-B8, J3-B8, P7-9	SPI CLK	I	P7-7, J1-C8, J2-C8, J3-C8
9	Line 4–	O	J5-B30	GND	–	Station ground	GND	–	Station ground
10	Spare 28	–	–	Spare 37	–	–	Line 4+	O	J5-B28
11	Line 3–	I	J5-C30	Spare 19	–	–	Spare 10	–	–
12	Spare 1	–	–	Spare 38	–	–	Line 3+	I	J5-C28
13	WL DC Control	O	J3-A27	WL DC Control REQ*	O	J3-B27	Spare 46	–	–
14	GND	–	Station ground	GND	–	Station ground	GND	–	Station ground
15	14.2 VDC	I	P8 pins 3, 4 (thru F1)	14.2 VDC	I	P8 pins 3, 4 (thru F1)	14.2 VDC	I	P8 pins 3, 4 (thru F1)
16	Spare 2	–	–	Reset*	I	J1-B16, J2-B16, J3-B16, P7-3	Spare 47	–	–
17	Spare 29	–	–	Spare 6	–	–	Spare 24	–	–
18	Spare 15	–	–	Spare 20	–	–	Spare 25	–	–
19	Spare 30	–	–	Spare 39	–	–	Wireline ID	O	J3-C22
20	Spare 16	–	–	Coded WL RX Audio	I	J1-B20, J2-B20, J3-B20	Raw WL TX Audio	O	J1-C20, J2-C20, J3-C20
21	Chassis GND	–	–	Chassis GND	–	–	Chassis GND	–	–
22	Spare 31	–	–	Spare 40	–	–	Spare 27	–	–
23	Spare 3	–	–	Spare 7	–	–	Spare 11	–	–
24	Spare 32	–	–	Spare 41	–	–	Spare 48	–	–
25	Spare 17	–	–	Spare 21	–	–	Spare 49	–	–
26	Line 2+	I/O	J6-4	Line 2+	I/O	J6-4	Line 2+	I/O	J6-4
27	Spare 4	–	–	Spare 8	–	–	Spare 12	–	–
28	Line 2–	I/O	J6-3	Spare 22	–	–	Spare 50	–	–
29	Spare 34	–	–	Spare 43	–	–	Spare 26	–	–
30	Line 1+	I	J6- 2	Line 1+	I	J6-2	Line 1+	I	J6-2
31	Spare 36	–	–	Spare 23	–	–	Spare 51	–	–
32	Line 1–	I	J6-1	Spare 9	–	–	Spare 13	–	–

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Table 3. J1 OPTION1 CONNECTOR									
Pin No.	Row A	Input/ Output	To/From	Row B	Input/ Output	To/From	Row C	Input/ Output	To/From
1	Spare	–	–	Spare A12	–	J2-B1	Spare A1	–	–
2	GND	–	Station ground	GND	–	Station ground	GND	–	Station ground
3	5 VDC	I	P8 pins 7, 8	5 VDC	I	P8 pins 7, 8	5 VDC	I	P8 pins 7, 8
4	GPIO_1 (CNTR I/O)	I/O	J2-A4, J3-A13, J4-A4, J5-C29	GPO_14' (WCO)	O	J2-B4, J5-B29	GPO_14 (WCO)	O	J2-C4, J3-A30
5	Spare	–	J2-A5	RF Relay Control Out	O	J2-B5, J5-C9	GPI_14' (WCI)	I	J2-C5, J5-A29
6	Spare	–	J2-A6	RF Relay Control In	I	J2-B6, J3-A24	GPI_9 or GPO_3 (WCIO)	I/O	J2-C6, J5-A28
7	MOSI	I	P7-8, J2-A7, J3-A7, J4-A7	GPI_14 (WCI)	I	J2-B7, J5-B26	GPI_14'' (WCI)	I	J2-C7, J5-A26
8	GND	–	Station ground	MISO	O	P7-9, J2-B8, J3-B8, J4-B8	SPI CLK	I	P7-7, J2-C8, J3-C8, J4-C8
9	GPIO_0 (CNTR I/O)	I/O	J2-A9, J3-A17, J5-C24	GND	–	Station ground	GND	–	Station ground
10	OP1 CS2*	I	J3-A10	OP1 CS4*	I	J3-B10	OP1 CS3*	I	J3-C10
11	Secure Control2	–	N/C	OP1 CS1*	I	J3-B11	GPI_7 (WCI)	I	J2-C11, J5-A22
12	SCI RX Option1	O	J3-A9	GPO_15'' (WCO)	O	J5-B21	Spare A11	–	J2-C12
13	Spare	–	–	Spare A18	–	J2-B13	SCI TX Option1	I	J3-B9
14	GND	–	Station ground	GND	–	Station ground	GND	–	Station ground
15	14.2 VDC	I	P8 pins 3, 4 (thru F1)	14.2 VDC	I	P8 pins 3, 4 (thru F1)	14.2 VDC	I	P8 pins 3, 4 (thru F1)
16	Disc RX Audio	I	J2-A16, J3-A16, J5-A16	Reset*	I	J2-B16, J3-B16, J4-B16	Aux TX Audio	I	J2-C16, J3-C16, J5-A17
17	GND	–	Station ground	Decrypted RX Audio	I	J2-B17, J3-B17	Clear TX Audio	I	J2-C17, J3-C17
18	GND	–	Station ground	GND	–	Station ground	TX Code Detect*	I	J2-C18, J3-C19, J5-A14
19	RX Code Detect*	I	J2-A19, J3-A19, J5-C14	Ext Code Detect	I	J2-B19, J3-B19, J5-B14	Option1 ID	O	J3-C18
20	Coded Mod Audio	I	J2-A20, J3-A20	Coded WL RX Audio	I	J2-B20, J3-B20, J4-B20	Raw WL TX Audio	I	J2-C20, J3-C20, J4-C20
21	GND	–	Station ground	Secure RX Audio	I	J2-B21, J3-B21	GND	–	Station ground
22	RSSI	I	J2-A22, J3-A22, J5-C11	GPI_12 or GPO_6 (WCIO)	I/O	J2-B22, J5-B11	GPO_2 (WCO)	O	J2-C22, J5-A11
23	Ext PTT*	I	J2-A23, J3-A23, J5-C10	GPI_11 or GPO_5 (WCIO)	I/O	J2-B23, J5-B12	VSWR)FAIL* (WCO)	O	J2-C23, J5-A10
24	GPI_10 or GPO_4 (WCIO)	I/O	J2-A24, J5-C12	GPI_13 or GPO_7 (WCIO)	I/O	J2-B24, J5-B9	Carrier SQ Override (WCI)	I	J2-C24, J5-A9
25	Opt_IRQ*	O	J2-A25, J3-C23	GPO_0 (WCO)	O	J2-B25, J5-A12	Aux TX Audio Mode (WCI)	I	J2-C25, J5-A8
26	GPI_15 (WCI)	I	J2-A26, J5-C7	Ext Repeat* (WCI)	I	J2-B26, J5-B7	Ext Failsoft (WCI)	I	J2-C26, J5-A7
27	RX Inhibit-R2 Status	I	J2-A27, J3-B26, J5-C6	Repeater ON/OFF (WCI)	I	J2-B27, J5-B6	GP1_15' (WCI)	I	J2-C27, J5-A6
28	TX PL On/Off (WCI)	I	J2-A28, J5-C5	Spectra Tac Enc Disable (WCI)	I	J2-B28, J5-B5	RX PL Override (WCI)	I	J2-C28, J5-A5
29	Failsoft OUTPUT (WCO)	O	J2-A29, J5-C4	Carrier Detect Switch	I	J2-B29, J3-B24, J5-B4	AC Fail	I	P8-5, J2-C29, J3-C24, J5-A4
30	GPO_15 (WCO)	O	J2-A30, J5-C3	GPO_15' (WCO)	O	J2-B30, J5-B3	SCI_CLCK1	O	J2-C30, J5-A3, J3-C28
31	Rdstat-R2 Control	I	J2-A31, J5-C2, J3-A26	PL Detect Switch (WCO)	O	J2-B31, J5-B2	PA Fail (WCO)	O	J2-C31, J5-A2
32	TX Lock (WCO)	O	J2-A32, J5-C1	RX Lock (WCO)	O	J2-B32, J5-B1	GPO_8 (WCO)	O	J2-C32, J5-A1

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Table 4. J2 OPTION2 CONNECTOR									
Pin No.	Row A	Input/ Output	To/From	Row B	Input/ Output	To/From	Row C	Input/ Output	To/From
1	Spare A14	–	–	Spare A12	–	J1-B1	Spare A15	–	–
2	GND	–	Station ground	GND	–	Station ground	GND	–	Station ground
3	5 VDC	I	P8 pins 7, 8	5 VDC	I	P8 pins 7, 8	5 VDC	I	P8 pins 7, 8
4	GPIO_1 (CNTR I/O)	I/O	J1-A4, J3-A13, J4-A4, J5-C29	GPO_14' (WCO)	O	J1-B4, J5-B29	GPO_14 (WCO)	O	J1-C4, J3-A3
5	Spare A16	–	J1-A5	RF Relay Control Out	O	J1-B5, J5-C9	GPI_14' (WCI)	I	J1-C5, J5-A29
6	Spare A19	–	J1-A6	RF Relay Control In	I	J1-B6, J3-A24	GPI_19 or GPO_3 (WCIO)	I/O	J1-C6, J5-A28
7	MOSI	I	P7-8, J1-A7, J3-A7, J4-A7	GPI_14 (WCI)	I	J1-B7, J5-B26	GPI_14'' (WCI)	I	J1-C7, J5-A26
8	GND	–	Station ground	MISO	O	P7-9, J1-B8, J3-B8, J4-B8	SPI CLK	I	P7-7, J1-C8, J3-C8, J4-C8
9	GPIO_0 (CNTR I/O)	I/O	J1-A9, J3-A17, J5-C24	GND	–	Station ground	GND	–	Station ground
10	OP2 CS2*	I	J3-A11	N/C	–	–	OP2 CS3*	I	J3-C11
11	Secure Control2	–	N/C	OP2 CS1*	I	J3-B12	GPI_7 (WCI)	I	J1-C11, J5-A22
12	SCI RX Option2	O	J3-C9	N/C	–	–	Spare A11	–	J1-C12
13	Spare A17	–	–	Spare A18	–	J1-B13	SCI TX Option2	I	J3-A8
14	GND	–	Station ground	GND	–	Station ground	GND	–	Station ground
15	14.2 VDC	I	P8 pins 3, 4 (thru F1)	14.2 VDC	I	P8 pins 3, 4 (thru F1)	14.2 VDC	I	P8 pins 3, 4 (thru F1)
16	Disc RX Audio	I	J1-A16, J3-A16, J5-A16	Reset*	–	J1-B16, J3-B16, J4-B16	Aux TX Audio	I	J1-C16, J3-C16, J5-A17
17	GND	–	Station ground	Decrypted RX Audio	I	J1-B17, J3-B17	Clear TX Audio	I	J1-C17, J3-C17
18	GND	–	Station ground	GND	–	Station ground	TX Code Detect*	I	J1-C18, J3-C18, J5-A14
19	RX Code Detect*	I	J1-A19, J3-A19, J5-C14	Ext Code Detect	I	J1-B19, J3-B19, J5-B14	Option2 ID	O	J3-B18
20	Coded Mod Audio	I	J1-A20, J3-A20	Coded WL RX Audio	I	J1-B20, J3-B20, J4-B20	Raw WL TX Audio	I	J1-C20, J3-C20, J4-C20
21	GND	–	Station ground	Secure RX Audio	I	J1-B21, J3-B21	GND	–	Station ground
22	RSSI	I	J1-A22, J3-A22, J5-C11	GPI_12 or GPO_6 (WCIO)	I/O	J1-B22, J5-B11	GPO_2 (WCO)	O	J1-C22, J5-A11
23	Ext PTT*	I	J1-A23, J3-A23, J5-C10	GPI_11 or GPO_5 (WCIO)	I/O	J1-B23, J5-B12	VSWR Fail (WCO)	O	J1-C23, J5-A10
24	GPI_10 or GPO_4 (WCIO)	I/O	J1-A24, J5-C12	GPI_13 or GPO_7 (WCIO)	I/O	J1-B24, J5-B9	Carrier SQ Override (WCI)	I	J1-C24, J5-A9
25	OPT_IRQ*	O	J1-A25, J3-C23	GPO_0 (WCO)	O	J1-B25, J5-A12	Aux TX Audio Mode (WCI)	I	J1-C25, J5-A8
26	GPI_15 (WCI)	I	J1-A26, J5-C7	Ext Repeat* (WCI)	I	J1-B26, J5-B7	Ext Failsoft (WCI)	I	J1-C26, J5-A7
27	RX Inhibit-R2 Status	I	J1-A27, J3-B26, J5-C6	Repeater ON/OFF (WCI)	I	J1-B27, J5-B6	GPI_15' (WCI)	I	J1-C27, J5-A6
28	TX PL On/Off (WCI)	I	J1-A28, J5-C5	Spectra Tac Enc Disable (WCI)	I	J1-B28, J5-B5	RX PL Override (WCI)	I	J1-C28, J5-A5
29	Failsoft OUTPUT (WCO)	O	J1-A29, J5-C4	Carrier Detect Switch	I	J1-B29, J3-B24, J5-B4	AC Fail	I	P8-5, J1-C29, J3-C24, J5-A4
30	GPO_15 (WCO)	O	J1-A30, J5-C3	GPO_15' WCO)	O	J1-B30, J5-B3	SCI_CLCK1	O	J1-C30, J5-A3, J3-C28
31	Rdstat-R2 Control	I	J1-A31, J5-C2, J3-A26	PL Detect Switch (WCO)	O	J1-B31, J5-B2	PA Fail (WCO)	O	J1-C31, J5-A2
32	TX Lock (WCO)	O	J1-A32, J5-C1	RX Lock (WCO)	O	J1-B32, J5-B1	GPO_8 (WCO)	O	J2-C32, J5-A1

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Table 5. J3 CONTROLLER CONNECTOR									
Pin No.	Row A	Input/ Output	To/From	Row B	Input/ Output	To/From	Row C	Input/ Output	To/From
1	14.2 VDC	I	P8 pins 3, 4 (thru F1)	14.2 VDC	I	P8 pins 3, 4 (thru F1)	14.2 VDC	I	P8 pins 3, 4 (thru F1)
2	GND	–	Station ground	GND	–	Station ground	GND	–	Station ground
3	5 VDC	I	P8 pins 7, 8	5 VDC	I	P8 pins 7, 8	5 VDC	I	P8 pins 7, 8
4	8 VDC	I	U102-3	Wireline 3/4 TXD	I	J4-B4	Wireline 3/4 RXD	O	J4-C4
5	Wireline 1/2 TXD	I	J4-A5	Wireline 1/2 RXD	O	J4-B5	Wireline BCLK	O	J4-C1
6	Wireline 3/4 FSYNC	O	J4-A6	Wireline MCLK	O	J4-A1	Wireline 1/2 FSYNC	O	J4-C6
7	MOSI	O	P7-8, J1-A7, J2-A7, J4-A7	Wireline2 Latch CS*	O	J4-B6	Wireline1 Latch CS*	O	J4-C7
8	SCI TX Option2	O	J2-C13	MISO	I	P7-9, J1-B8, J2-B8, J4-B8	SPI CLK	O	P7-7, J1-C8, J2-C8, J4-C8
9	SCI RX Option1	I	J1-A12	SCI TX Option1	O	J1-C13	SCI RX Option2	I	J2-A12
10	OP1 CS2*	O	J1-A10	OP1 CS4*	O	J1-B10	OP1 CS3*	O	J1-C10
11	OP2 CS2*	O	J2-A10	OP1 CS1*	O	J1-B11	OP2 CS3*	O	J2-C10
12	Ext SPI CS1*	O	J5-C21	OP2 CS1*	O	J2-B11	Ext SPI CS2*	O	J5-A21
13	GPIO_1 (CNTR I/O)	I/O	J1-A4, J2-A4, J5-C29	PA D/A CS*	O	P7-6	PA A/D CS*	O	P7-10
14	10 VDC EX	I	Regulator U101-3	10 VDC EX	I	Regulator U101-3	GND	–	Station ground
15	10 VDC RX	I	Regulator U101-3	10 VDC RX	I	Regulator U101-3	GND	–	Station ground
16	Disc RX Audio	O	J1-A16, J2-A16, J5-C17	Reset*	O	J1-B16, J2-B16, J4-B16, P7-3	Aux TX Audio	I	J1-C16, J2-C16, J5-A17
17	GPIO_0 (CNTR I/O)	I/O	J1-A9, J2-A9, J5-C24	Decrypted RX Audio	I	J1-B17, J2-B17	Clear TX Audio	O	J1-C17, J2-C17
18	Ptemp+	I	P10-3	Option2 ID	I	J2-C19	Option1 ID	I	J1-C19
19	RX Code Detect*	O	J1-A19, J2-A19, J5-C14	Ext Code Detect	I	J1-B19, J2-B19, J5-B14	TX Code Detect*	O	J1-C18, J2-C18, J5-A14
20	Coded Mod Audio	I	J1-A20, J2-A20	Coded WL RX Audio	O	J1-B20, J2-B20, J4-B20	Raw WL TX Audio	I	J1-C20, J2-C20, J4-C20
21	GND	–	Station ground	Secure RX Audio	I	J1-B21, J2-B21	GND	–	Station ground
22	RSSI	O	J1-A22, J2-A22, J5-C11	GND	–	Station ground	Wireline ID	I	J4-C19
23	Ext PTT*	I	J1-A23, J2-A23, J5-C10	N/C	–		Opt IRQ*	O	J1-A25, J2-A25
24	RF Relay Control	O	J1-B6, J2-B6	Carrier Detect Switch	O	J1-B29, J2-B29, J5-B4	AC Fail	I	P8-5, J1-C29, J2-C29, J5-A4
25	Trunk TX Inhibit*	I	J5-C8	Trunk Duplex Enable*	I	J5-B8	Serial ID	I	U100-2
26	Rdstat-R2 Control	O	J1-A31, J2-A31, J5-C2	RX Inhibit-R2 Status	I	J1-A27, J2-A27, J5-C6	Antenna Relay	O	P10-1, J5-A13
27	WL DC Control	I	J4-A13	WL DC Control REQ*	I	J4-B13	PA Enable*	O	P7-2
28	GND	–	Station ground	GND	–	Station ground	SCI_CLKK1	O	J1-C30, J5-A3, J2-C30
29	Trunk RX Audio	O	J7-22	Trunk TX Data+	I	J7-13	Trunk TX Data–	I	J7-21
30	MRTI RX Audio	O	J7-7	MRTI TX Audio	I	J7-1	Aux Carrier* or TSTAT	O	J7-12, J7-10
31	Trunk Mute*	I	J7-23	MRTI RX Carrier*	O	J7-15	PL Strip* or CCI	I	J7-24
32	Patch Inhibit* or RSTAT	O	J7-25	MRTI Monitor*	I	J7-4	Trunk MRTI PTT*	I	J7-2, J7-11

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Parts List

TTN5062B Backplane Interconnect Module

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C100,101	2113743A19	CAPACITOR, FIXED: UF +/-10%; 100 V: 0.1 uF, +/-10%; 16V 10 uF, +/-20%; 50 V 22 uF, +/-10%; 20 V
C102	2380090M24	
C103,104	2311049A21	
F1,2	6583049X05	FUSE: FUSE 5A FAST ACT W/HOLDER FUSE 5A FAST ACTING
F1,2	6583049X16	
J1 thru 5	0982513W01	CONNECTOR, RECEPTACLE: RECEPT 96 PIN PF EURO STD TERM BLOCK 4P WIRETRAP 22AWG RECEPT DB 25 PF
J6	3183021X02	
J7	0982528W01	
P7	2885155U01	CONNECTOR, PLUG: plug, 10-contact HDR 2X4 VERT PWR HDR 3 POS STR .1 CTR GLD PLTD
P8	2884490T04	
P10	2813922A03	
U100	5191036A01	INTEGRATED CIRCUIT: (SEE NOTE) IC SILICON SN SM DS2400 Regulator, LO Voltage Dropout IC 8V POSITIVE REG,1.0A
U101	5182276R82	
U102	5113816D03	

Note: For optimum performance, integrated circuits must be ordered by Motorola part number.

The differences between TTN5062A and TTN5062B are:

1. The system connector was rotated 180 degrees.
2. Some of the pin assignments were changed.
3. Wireline connector changed from 3183021X01 to 3183021X02.

TTN5062B Backplane Interconnect Module

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
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